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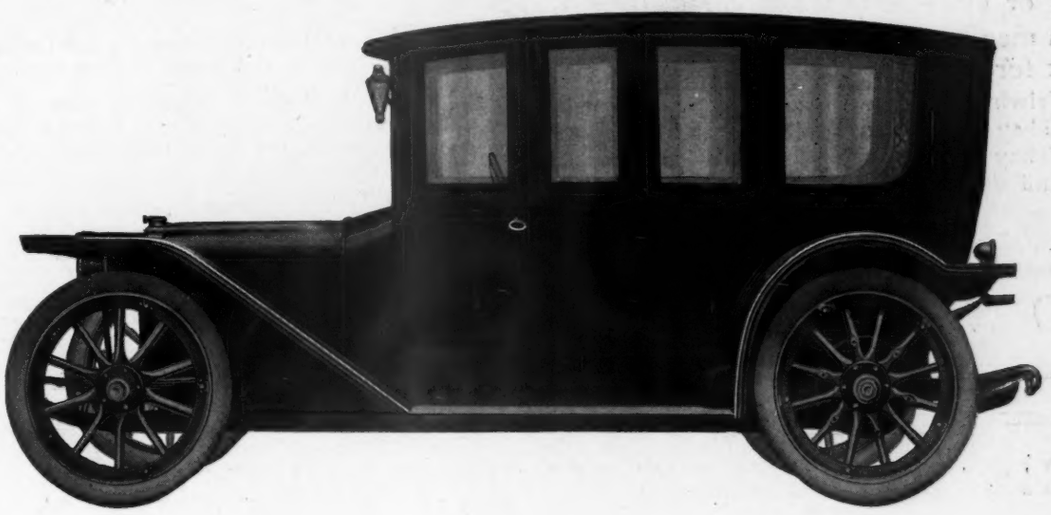
MOTOR AGE

VOLUME XXII CHICAGO, NOVEMBER 21, 1912 NUMBER 21



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MOTOR AGE

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VOL. XXII, No. 21 CHICAGO, NOVEMBER 21, 1912 $3.00 PER YEAR

MOTOR AGE

GENERAL VIEW OF OLYMPIA HALL, IN WHICH GREAT BRITAIN'S ELEVENTH ANNUAL SHOW IS HELD

All Europe Represented at Olympia

More Than 700 Exhibitors Display Their 1913 Wares in England's Eleventh Annual Show —Nothing Radical in Car Mechanism—Strokes Longer, Wheelbase Extended— Engine Starters Gain a Footing—American Makers Making Headway

By W. F. Bradley

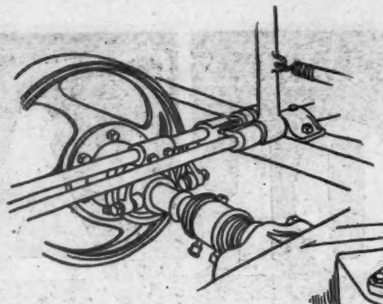
LONDON, Nov. 9—With the opening of the eleventh annual Olympia show today, John Bull proved to the world that his is the only really international motor car exhibition, and the one place where the trend of the industry the world over can best be ascertained. There are more than 700 exhibitors, but of the 197 makes of cars and chassis on exhibit there are fewer than half of British manufacture. Ten countries are represented in the display of cars, Great Britain and Ireland showing eighty-nine makes, France next with forty-five makes, the United States third with twenty-one, Germany, Italy and Belgium each with between ten and twenty, Switzerland with two and Austria, Spain and Holland with one each.

There are two reasons for the Olympia show being interesting to the one who follows the industry: first, because it is the first of the European season, and so gives an advanced line on European trends; and secondly, it is distinctive by being the only one having full international representation, the British free-trade policy bringing in products from practically every manufacturing country in the world. With such a source of supply, the hall used for the purpose of the exhibition is too small; indeed it is doubtful if there is any building in London capable of accommodating all the manufacturers and agents who would like to show their wares.

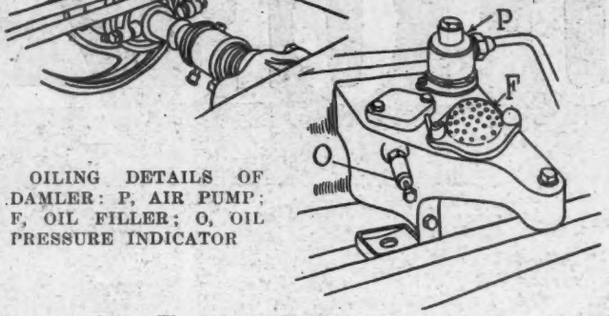
The show is singularly free from startling changes. It is a show of detailed refinements and general improvements, of undoubted progress, but of progress on well defined lines. Entirely new models are rare; for the most part the cars at the show are modifications of those of a year ago, the modifications mostly tending towards accessibility, ease of dismounting, general simplification and silent operation. Where there are new models they are generally smaller rather than larger than the previously existing types of cars on the market. Europe seems to like the small cars.

The extent of the American invasion is seen when it is noted that the United States stands third in the number of ex-

hibitors. Forty-seven chassis of American production were shown, the wares of twenty-one manufacturers who have entered the foreign field. Last year there were but six American exhibitors, so that the extent of the growth of American trade in England may be realized, in that fifteen new makers have taken up agencies abroad in the last year. This is a growth of about 250 per cent in numbers alone, while in volume of sales it is to be imagined that the growth has been even more tremendous.



CLUTCH MOVEMENT OF D. F. P., SHOWING TOOTHED SEGMENTS FOR REVERSING MOTION



OILING DETAILS OF DAMLER: P, AIR PUMP; F, OIL FILLER; O, OIL PRESSURE INDICATOR

The trend in current design abroad, as exemplified by 666 chassis, of which 619 are of European production, is toward lighter weight, smaller power units of high efficiency, more complete equipment than formerly, and considerably condensed lines throughout. Last year seven European makers used the Knight motor. This year the exhibits of the same number of makers include Knight motors, five new makers, however, have been added to the Knight list, but one of last year's Knight exhibitors having cars so motored in 1912.

Rotary-Valve Motors

Rotary-valve motors are more in evidence, while various freak practices, such as the use of friction drives of various new and novel types, belt drives, and seven-speed gearsets, are notable. The average horsepower of all cars exhibited is 23.2, and the aggregate of 666 motors is 15,448, or less than the combined power of the engines of the Lusitania, which have 17,000 horsepower. The trend is thus seen to be strongly in favor of low power and high efficiency.

This accounts for the popularity of the four-speed gearset, in spite of the almost universal adoption of the long-stroke engine form. The horsepower ratings from which these calculations were taken were based on the R. A. C. formula, so that it will be understood is accurate only where the square-type motor is used. Those of long stroke, which are decidedly in the majority, will develop greater actual horsepower than is ascribed by the official rating. The most powerful motor shown is a four-cylinder Benz, 7¼ by 7⅞ inch bore and stroke. This motor is rated at 200 horsepower by the makers and 84.5 by the R. A. C. The smallest motor is that of the Bedelia cyclecar, whose single-cylinder motor, 3 by 3¼ inches, is allowed 3.4 horsepower by this formula.

Notable among the long-stroke fraternity are the Zebra, a French car, with cylinders 2 by 4; the Pilian, also of France, with an engine 2⅛ by 4¼; the Bayard, of France, 2⅜ by 4¾; the French Gregoire and English Waverly, both 2½ by 5⅛; the Gobron and WacChenard-Walcker, both French productions, with bores and strokes of 3 by 6; the Clathorpe from England and the Pipe from France, 3⅛ by 6; and the S. P. A., the most radically long-stroked car among the larger models, with cylinders 4¼ by 7⅞. The strong preference for preponderence of stroke over bore is shown by the fact that out of 666 chassis exhibited, 634 had longer strokes than bores, thirty were of the square type, while but two have larger bores than strokes. These latter, the English N. E. C.s, use the same stroke of 4½ inches for four-cylinder engines with bores of both 4½ and 5 inches.

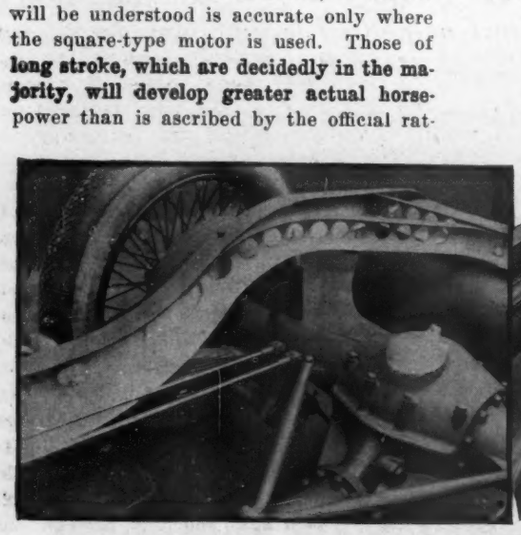
Two hundred and twenty-nine of the chassis shown have three-speed gearsets, 318 have four-speed outfits, the rest being distributed among the two-speed, belt-drive and friction-drive types, of which six are friction driven. The popularity of the friction drive is to be traced to the wide speed-range required with the small motors used generally. Of the chassis exhibited, 101 are worm driven.

A difference from American practice that is especially notable is the variance of wheeltrack indulged in by the foreigners. Nothing like a standard wheel tread is observed by the makers abroad. Treads as narrow as 3 feet 2 inches are noticed in the cyclecar division, and as narrow as 39 inches among the regular motor cars. The widest shown is that of a Mercedes, whose track was 63 inches. The average is about 54 inches.

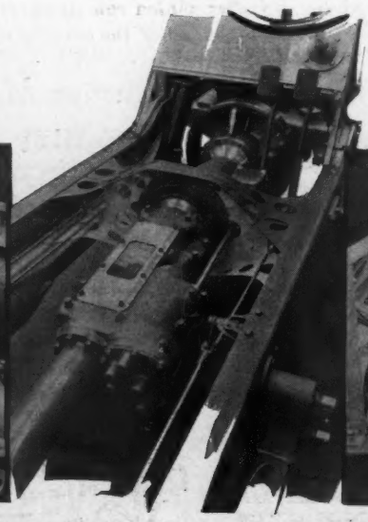
The Gearset Census

European cars are as a rule undertired, according to American standards, the average European car being of greater weight than American. The average for the show is about 36 by 3½, but is not a consistent average, being the mean between a conglomerate jumble of larger and smaller sizes. It is enough to notice in passing, however, that weight for weight, American cars are much better tired than are the foreign productions. Of course it is to be remembered that American roads impose more severe punishment upon motor car tires than do the boulevards of Europe. The smallest tires, as in nearly everything else, are found on the Baby Peugeot, and are of the diminutive size of 24 by 2½ inches.

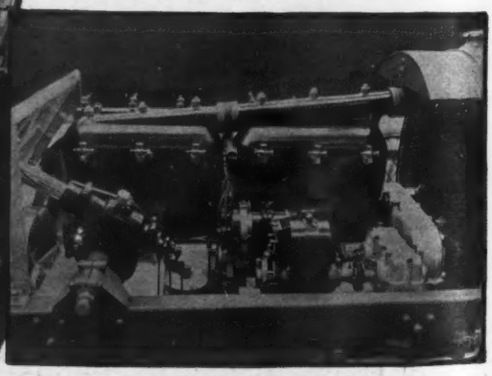
Great inconsistency is shown in the matter of road clearance. The average is about 9 inches, considerably lower than is practical on this continent, the highest shown being on the American Metz, which is 15 inches. The highest among the European exhibits, however, is 12½ inches, found on the Iris. There are several shown with 12 inches of clearance, and many with but 6. The least found is on the English Thorneycroft, which clears



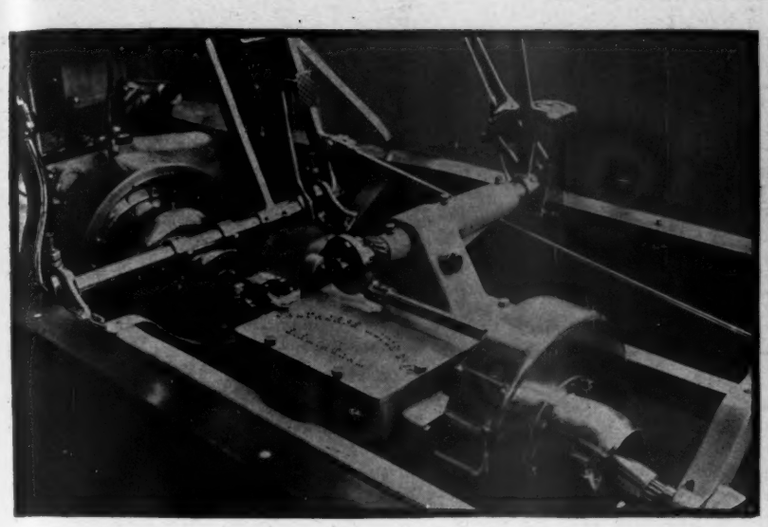
WORM-DRIVEN REAR AXLE ON SHEFFIELD-SIMPLEX



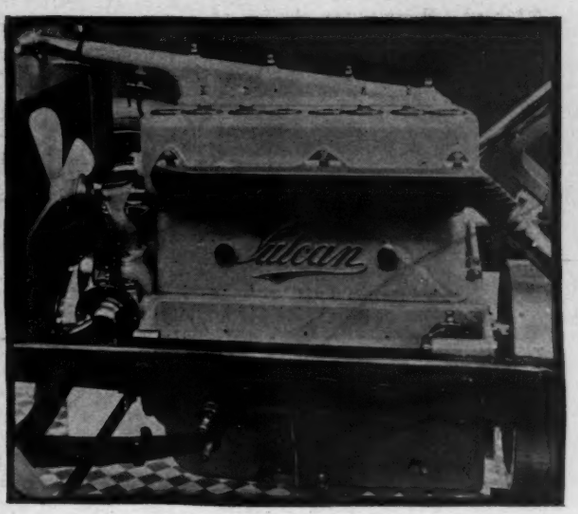
SHEFFIELD-SIMPLEX WITH GEARSET IN TORQUE TUBE



LIGHTING DYNAMO AND MAGNETO ON SHEFFIELD-SIMPLEX



TRANSMISSION FEATURES OF CAL THORPE SHOWING FOOT-BRAKE ADJUSTMENT



VULCAN MONOBLOC MOTOR SHOWING OIL PUMP ON RIGHT

the ground by a very scant 4 inches.

The Britisher's demand is for a car of medium or even low power. The great bulk of the business is being done in cars having motors rated at 16 to 20 horsepower, or with a bore varying from 3 to 3¾ inches. A four-cylinder motor with a bore of 4 inches is looked upon as a big model.

Six-cylinders do not show any increase; those firms having specialized in them retain them, but newcomers in this line are very rare. There has been an all round increase in piston strokes, the average stroke-bore ratio now getting very close to 2 to 1. Firms formerly being satisfied with 4⅛ inches stroke for a cylinder bore of 3⅛ inches have now risen up to 5½ or 5⅞ inches, and in not a few cases as high as 6¼ inches. Among the notable instances of increase in piston stroke is Panhard with a four-cylinder of 2¾ by 5½ inches. The square motor is dead and buried, apparently.

Progress of the Silent Chain

Silent-chain drive for cam and magneto shafts has made considerable progress. This is helped by the fact that on the standard European motor the L-type of casting is adopted and, as natural circulation of water is in the majority, a single chain can be used for the entire motor. This is a common arrangement and is to be found on a number of leading cars. With one chain going round three pinions it is customary to mount the magneto drive shaft on an eccentric, thus allowing for whatever wear may develop. Among the interesting alternatives is the Chenard-Walcker method described in Motor Age November 14.

On the new Vauxhall there is an alternative method. The magneto platform on the crankchamber is in two parts, the lower one being fixed to the casting and forming a base having two bolts with eccentric ends. These bolts support the actual magneto table, thus when the eccentrics are rotated the center of the magneto spindle moves through the same path as the center of the magneto pinion, when the position of that wheel is altered to adjust the driving chain.

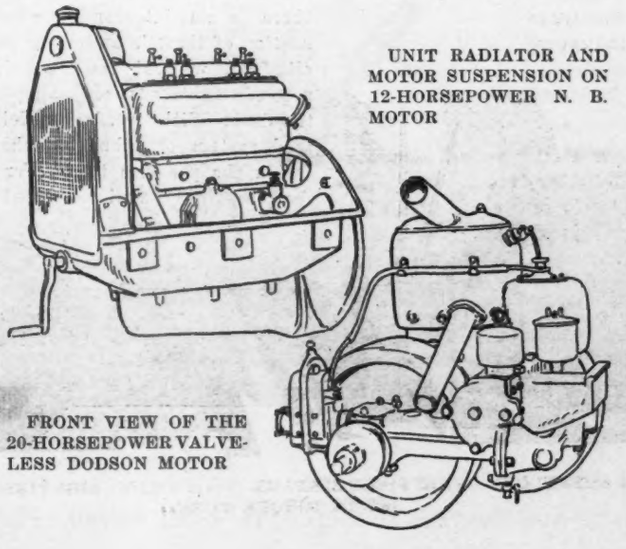
Even with only two auxiliary shafts to drive, some makers have preferred to employ two chains. This is done on the new six-cylinder Delage, one chain going from the crankshaft to the camshaft, and another one from the crankshaft to the magneto shaft. In such a case, no adjustment is provided for. In some cases automatic adjustment has been sought.

As Swift Uses It

On the Swift motor a single chain incircles the pinion on the crankshaft, the camshaft and an idler. A second chain from this idler drives the magneto, a radius rod being interposed between the idler and the magneto spindles, while a turnbuckle on this rod enables the magneto chain to be adjusted by moving the idler away from the magneto. In addition, the idler pinion can be adjusted to regulate the tension of the main chain, for the wheel is mounted on bearings on a carrier plate having slots through which the holding bolts pass. These slots permit the required movement of the idler when the bolts are released.

If a count were made it would doubtless be found that about 60 per cent of the European cars are now fitted with silent chain drive in place of meshing pinions. The minority, however, comprises very important manufacturers and practically all the Italian makes.

Lubrication has received a lot of attention. The plain splash system cannot claim more than one-tenth of the total number of cars at the show. Pump circulating systems are found everywhere, but the details of these systems vary enormously. There appears to be an increase in the number of firms making use of forced-feed throughout the motor, this including main bearings, connecting rod ends, camshaft bearings, and, in a few cases, the wrist pins. This is more common on the French than on the English cars, although there are some notable examples of the English makers of high-efficiency motors using forced feed throughout. Generally, however, the English makers prefer a pressure feed to the main bearings and troughs for the connecting rod ends.

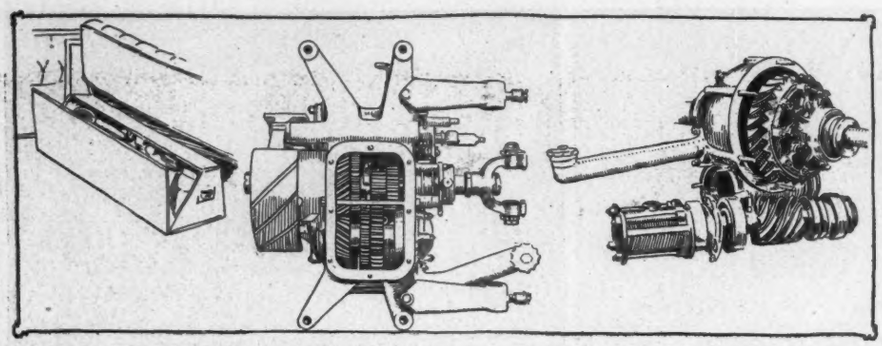


UNIT RADIATOR AND MOTOR SUSPENSION ON 12-HORSEPOWER N. B. MOTOR

FRONT VIEW OF THE 20-HORSEPOWER VALVELESS DODSON MOTOR

Oiling on Delage Six

Delage, on the new six, has taken the oil pump off the end of the camshaft and put in the oil sump, driven, of course, from the camshaft. The oil is carried up to the reserve supply tank built in the dashboard and from there carried under pressure to the four main bearings, through the bored shaft to the connecting rod ends, through the bored camshaft to the camshaft bearings, and out through the forward end of the camshaft to the two silent chains. When the switch is off the reserve supply



ARGYLL FOOT REST AND TOOL CASE BACK OF FRONT SEAT

NAPIER THREE-SPEED GEAR-SET. ONE PAIR GEARS WITH HELICAL TEETH

WORM DRIVE ON NAPIER 30. NOTICE LONG FILLER PIPE

of oil in the dashboard tank is isolated; should the combined switch and tap be turned on while the motor is standing, the oil will naturally flow into the sump, but there would be no serious consequences, for as soon as the motor is started up the oil is carried to the tank and fills it, reducing the quantity in the sump to the normal level. The arrangement, of course, is intended to increase the quantity of oil in circulation without making the sump too bulky, and also assist, in a certain measure, the cooling of the oil.

Lubrication Ideas

It is recognized that with forced-feed lubrication good provision must be made for clearing away whatever accumulations of dirt may gather at the filters. In this connection there is an unusual arrangement on the Vauxhall: the fine gauze filter, instead of being rigidly secured in the crankchamber above the oil reservoir, is in the form of a sliding tray, with a vertical plate on its front end, allowing it to be bolted to the motor base when in normal use. To withdraw it, there are only eight bolts to take away, when the entire filter can be pulled out like a tray. As the oil is always below the level of this tray, practically none is lost by the withdrawal. In the Vauxhall the oil pump is of the plunger type, operated by a ball-bearing eccentric on the camshaft, the air pump being operated from the same eccentric.

Star, which makes use of pressure feed throughout, has a small plunger indicator on the dashboard, the plunger being pushed out while pressure is maintained. In addition, there is a cock on the main feed pipe in order to ascertain that the oil is flowing correctly. There is a convenient oil pump location on the Vulcan, the pump being placed on the top of the extended web of the crankchamber, just to one side of the crankcase hanger. While the accessibility is good, a pump in this position may sometimes need priming, and it is because of this defect that other makes which had their pump above the oil tank have placed it in the base, where it is always in oil. Unic and Iris have made provision for lubricating the valve springs by fitting an oil-tight valve-spring cover, raising the front of the valve stem chamber, and boring one or two holes from this chamber into the crankcase. The oil coming out of the hole cannot overflow, for the top of the front edge of the chamber is higher than its level.

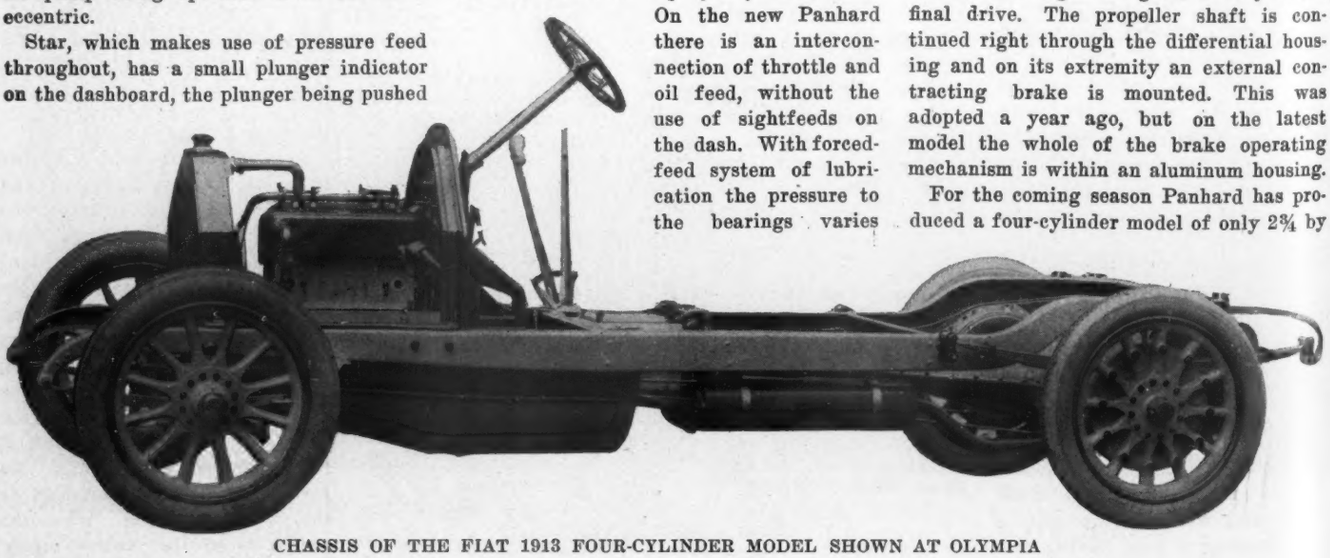
There are not many cars with the oil feed interconnected with the throttle. This is found on the Charrons, one of the few continental cars having what is practically a simple splash system. Here the interconnection is easily made, for the oil tank is in the dashboard and the accelerator pedal is connected up to a plunger in the outlet pipe, giving an increased opening as the gas opening is increased. The Daimler system of moving troughs has not been taken up by any other firms. On the new Panhard there is an interconnection of throttle and oil feed, without the use of sightfeeds on the dash. With forced-feed system of lubrication the pressure to the bearings varies from 7 to about 28 pounds. In a few cases the normal pressure is as high as 50 or 60 pounds, but the majority of makers appear to be satisfied to maintain a pressure of 7 to 10 pounds per square inch. Modern conditions call for an increase in the quantity of oil in circulation with pump-fed systems. This has been done either by increasing the size of the sump and fitting the bottom with fins to assist in cooling, or by the use of reserve tanks. In the Delage, as already explained, this reserve supply comes into circulation as soon as the switch is put in; on the Chenard-Walcker there is a reserve supply in a dashboard tank which automatically maintains a correct level in the sump.

Cooling by thermo-syphon circulation is slightly on the increase, but this is largely accounted for by the fact that medium-sized motors are more numerous, and for such motors the quantity of water necessary for thermo-syphon flow is not excessive. On the larger units the pump holds its own. On the Vauxhall car there is an interesting method of aiding the natural flow of water without any additional mechanism. The spindle of the radiator fan is carried rearwards through a gland into the water pipe, and on the extremity of the spindle is mounted a low-pitch propeller screw assisting the flow of water. The fan is driven in the usual way by belt. On the same car the air for the carbureter is drawn through slots in the top of the valve-chamber covers, this arrangement considerably reducing the hiss of the entering air. There are a number of other cars in which the air intake is from the valve stem chamber, the pipe going between the second and third cylinders.

Novel Rear Axle

La Buire has modified the canted type of rear axle employed for a number of years. There is a double reduction gear, the first reduction being by means of spur gearing, and the second by bevels with a ratio of roughly 1 to 1.5. It is claimed that the arrangement gives a very silent final drive. The propeller shaft is continued right through the differential housing and on its extremity an external contracting brake is mounted. This was adopted a year ago, but on the latest model the whole of the brake operating mechanism is within an aluminum housing.

For the coming season Panhard has produced a four-cylinder model of only 2¾ by



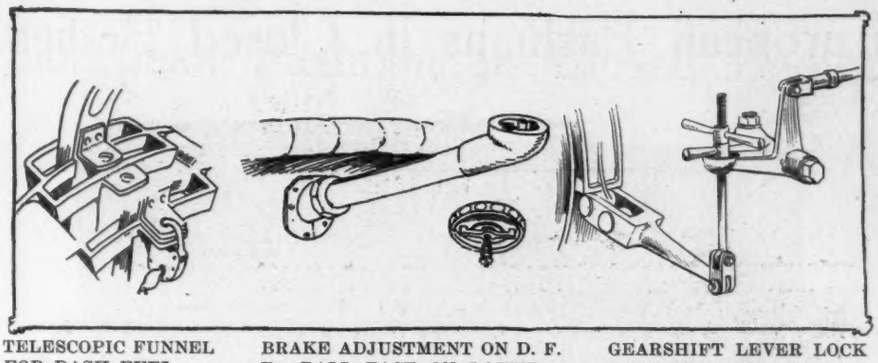
CHASSIS OF THE FIAT 1913 FOUR-CYLINDER MODEL SHOWN AT OLYMPIA

5½ inches bore and stroke, this being the smallest-sized motor built in this factory for a number of years. In its general lines the chassis resembles the larger Panhards, having unit construction of motor and gearbox with three-point suspension. The propeller shaft is carried in a torque tube having forked arms connected up to a double transverse frame member. On the front end of the propeller shaft, where it emerges from the torque tube, is mounted a metal disk faced with a very heavy band of solid rubber, the rubber-tired wheel thus formed being just below the overhanging portion of the transverse frame member, profiled to receive it. Under road inequalities the rubber block is brought in contact with the frame member, the normal clearance between them being not more than ¼ inch.

For the first time Panhard has made use of the ordinary selective type of change-speed mechanism and has provided the chassis with four speeds ahead. The rear axle is built up of two taper tubes united to a central differential housing of aluminum. The axle is not trussed. Springing at the rear is by absolutely flat semi-elliptics. The chassis is equipped with an electric lighting outfit, the dynamo being mounted through the dash and driven by inclosed gearing from the rear end of the motor. It is unusual to fit electric lighting outfits on cars of such small power.

Paucity of Engine Starters

Except on American cars, there is a rarity of self-starters. Delaunay-Belleville, which manufacturers a compressed air-type of self-starter, does not exhibit it, the London representatives of the company declaring that there is no demand for it. Sunbeam has just produced a pneumatic starter, the parts of which have been on the market for some time. Mounted o nthe top of the gearbox is a single-cylinder air-compressor of the Birkigt type. The lid of the gearbox forms the crankcase of the compressor, and the ribbed cylinder is bolted down to it. The piston is connected up by a crank to one of the wheels of the gearset, being brought into engagement as required. The air thus compressed is carried to a storage tank and can be used either for inflating tires or for engine starting. For this latter purpose there is a three-cylinder air motor mounted on the valve side of the engine and connected up to it by a roller chain and, as required, by a sliding pinion engaging with teeth cut on the periphery of the flywheel. The air motor drives the car motor externally, there being no added distributor to the main motor.



TELESCOPIC FUNNEL FOR DASH FUEL TANK ON ARGYLL

BRAKE ADJUSTMENT ON D. F. P. BALL FACE ON LOWER WING NUT RESTS IN CUP

GEARSHIFT LEVER LOCK THAT IS FOUND ON 1913 N. A. G. CARS

On the Scat a compressed-air type of starter is fitted, but this is a model having been on the market for a number of years. La Buire has a mechanical starter in the form of a ratchet and spring on the front end of the crankshaft, a wire cable coming from the mechanism to a lever on the side of the car. By pushing the side lever forward the spring is wound up, and by pulling it the motor is cranked. It is thus only a method of cranking from the seat, instead of in front, with the added advantage that powerful leverage is provided. There were about six electric types of starter and a smaller number of the acetylene gas group; a number of cars were fitted with the Bosch supplementary starting magneto, generally with its handle brought through the dashboard, but in the great majority of cases the starting crank was alone relied on to set the motor in motion.

There was a novelty in starting handles on a six-cylinder Sheffield-Simplex. The handle was brought out to the extreme front of the chassis, instead of being just at the base of the radiator, and the handle, instead of projecting outwards from the lever was hinged to this latter and when not in use formed a continuation of it, hanging up close against the transverse bar uniting the front ends of the frame members.

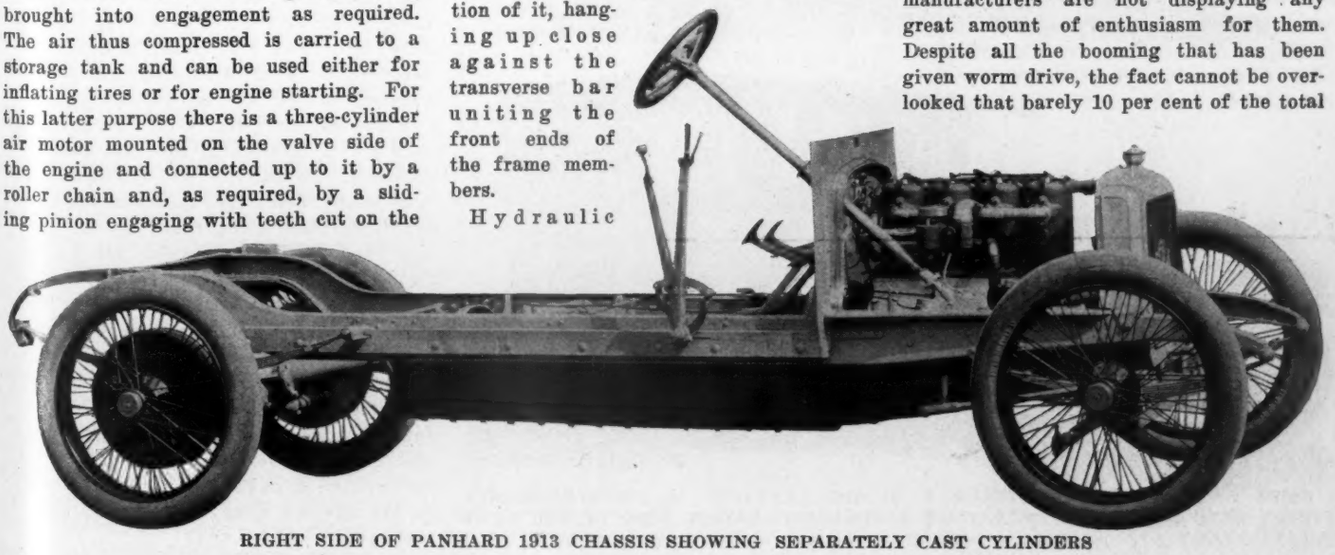
Hydraulic transmission is found on one car only. In is the Leutz system applied to a Charron chassis. This transmission was exhibited a year ago, the Charron company having then just bought the patent rights; in the meantime it has experimented with it to a considerable extent and declares that it has fulfilled all requirements. It is to be noted, however, that no attempt is being made to force it on the public, the new chassis evidently being put out merely as a feeler.

In the matter of gearsets, the general tendency for next season is to equip all chassis with four forward speeds. Up to the present four-speed sets have been confined to big cars, medium and small models having only three speeds. In response to the general demand four speeds are now being fitted to practically all models. The change is particularly noticeable with the class of cars rated at 10 to 16 horsepower.

Chain-Drive Gearsets Not Favored

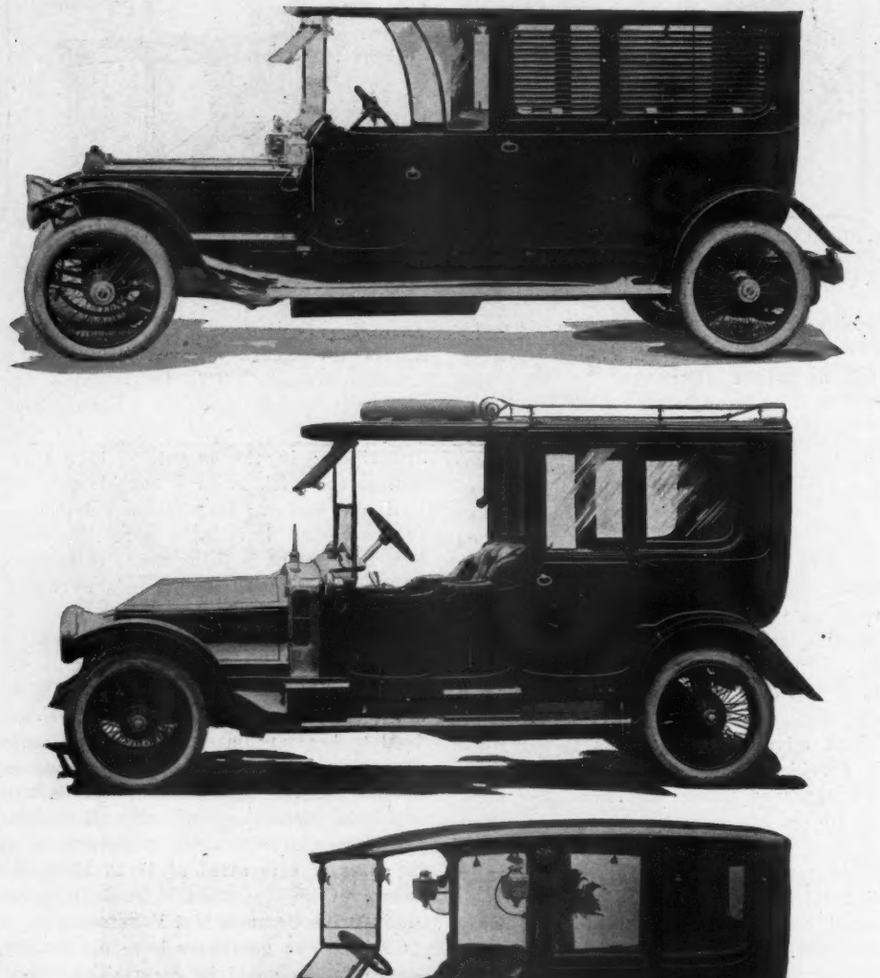
Chain-driven gearboxes have not caught on; so far as could be ascertained, there is only one model in the show. The selective type is universally employed, and in the majority of cases the shafts are in the same vertical plane, the size of the boxes being kept down to the lowest possible dimensions.

Worm-driven rear axles are making comparatively slow progress. Continental manufacturers are not displaying any great amount of enthusiasm for them. Despite all the booming that has been given worm drive, the fact cannot be overlooked that barely 10 per cent of the total



RIGHT SIDE OF PANHARD 1913 CHASSIS SHOWING SEPARATELY CAST CYLINDERS

European Fashions in Closed Bodies



FROM TOP TO BOTTOM—DAIMLER WITH ODD CURTAINS. A SIDDELEY-DEASEY FITTED WITH LANDAULET BODY. FIAT LANDAULET. NAPIER SIX-CYLINDER WITH TORPEDO BODY

number of European cars have this type of final drive. From a careful examination, the following is the complete list of firms showing cars with worm-driven rear axles at Olympia: Vulcan, Phoenix, Dennis, Albion, Dodson, Argyll, Armstrong-Whitworth, Belsize, Humber, Napier, Standard, Star, Straker-Squire, Turner, and Wolseley; all of them being British firms and having the overhead type. Sheffield-Simplex, Daimler, Rover, B. S. A., Lanchester, N. E. C., are British makers having the underneath type.

Continental firms with overhead worm are Sava, Gregoire, Brasier, De Dion Bouton, and Minerva. Peugeot has underneath type. Only a small number of the firms mentioned above are building worm-driven rear axles exclusively. The great majority produce both bevel and worm, the former having a great numerical advantage. This applies to Gregoire, Peugeot, Brasier, de Dion-Bouton and several of the English firms, which make one model with worm and half a dozen with bevel type of rear axle.

Poppet Valves Holding Own

There is a paucity of non-poppet valves at this year's show. The Knight sleeve-valve motor is found on Daimler, B. S. A., Siddeley-Deasy, Martini, and Minerva cars. In addition, Mors, Gregoire, and Bayard-Clement are using this motor on a certain number of their chassis.

Apart from the Knight the only other non-poppet valve motors are the Darracq with rotary distributor, Argyll with single sleeve, Piccard-Pictet built under the same license, the Itala and the Dodson two-cycle. It is to be noted that the Rover with single and twin-cylinder Knight motor has been withdrawn from the market and replaced by a small poppet-valve model. On the whole, therefore, there has been slow development in the practical application of the non-poppet valve since last year, for all the systems mentioned were on show a year ago. It is probable that the Paris show will see the presentation of a few new motors of the non-poppet type, but the fact remains that the poppet valve motor is holding its own very well, and that manufacturers are becoming more and more stringent in their requirements of new non-poppet types.

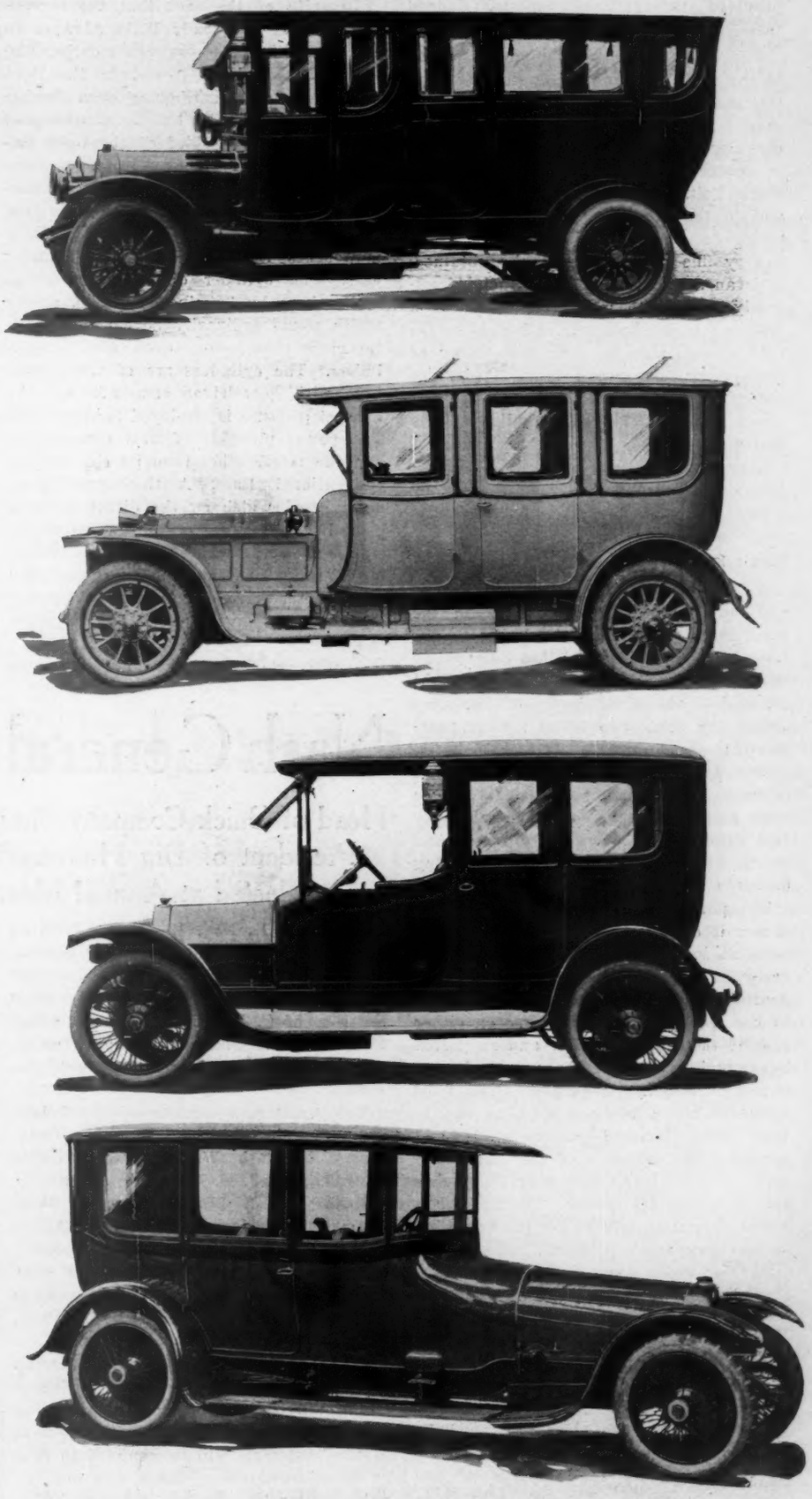
From the car owner's standpoint there is a lot of interest in the dashboard location of the gasoline and oil tanks. In very many cases the dashboard is abolished, its place being taken by the gasoline tank profiled to receive the bonnet, forming an unbroken line from the radiator cap to the windshield. The tank thus becomes an integral part of the chassis and is placed in position by the car maker and not by the body builder. Examples of this construction are to be found on the Unic models, illustrated in Motor Age, November 7. In other cases, where there is no dashboard, the two bolts on the side and a stay to the radiator are employed.

The dashboard tank has everything to recommend it from the standpoint of the car owner. It reduces piping to a minimum and leaves the space under the seats entirely free for luggage carrying. It is easily dismounted, it assures gravity feed even on steep hills, and it lends itself perfectly to the popular torpedo-type bodies. This location is not new, but it has not been commonly employed until the present season. The firms having had the gasoline tank on the dash for a few seasons have generally modified it to avoid all break between it and the body. An example of this is to be found on Delaunay-Belleville models, on Chenard-Walcker, Delage, and others. The best practice is for the tank to be cut away in order to fit round the steering column, so that it can be dismounted without disturbing this latter. The exhaust pipe is generally swept straight down to pass underneath the tank, so that there is nothing here to interfere with dismounting. Where the dashboard is not transformed into a tank, it is frequently made of aluminum, and is profiled to be flush with the bonnet. There are good examples of this on the Nazzaro and the Sava, where a full, vertical aluminum dash is fitted, flush with the bonnet, and the indicators mounted on it, the hand-pressure pump being neatly brought in through the angle pieces on one side. In some other cases, an example being the Sheffield-Simplex, a half dashboard of aluminum, together with sloping footrest, is employed, leaving the coachbuilder free to construct a full wood dash around it as best suits the type of body employed. The more common method, however, is for the dash to be full, for the strong tendency is for full torpedo lines without any break at the end of the bonnet.

Brake Adjustment Refinements

Ease of brake adjustment has received a lot of attention. In a large number of cases the winged nut for taking up wear on the differential brake is brought to the side of the chassis, instead of being directly on the brake shoes. There is a neat arrangement on the Mors chassis, where both adjustments are immediately under the footboards. The control for the foot brake, which is of the external contracting type, is by means of a winged nut just within the frame member. The rear wheel brakes have an equalizer just ahead of the differential casing, and from it a long rod attached to a short lever on the outer end of the transverse bar operated by the side lever. The end of the bar is threaded and has on it a winged nut; being mounted on the top of the gearbox it is readily accessible. Calthorpe has an interesting method of operating and adjusting the brake on the differential, which in this case is controlled by side lever. A skew pinion is mounted on the idler sleeve on the cross shaft operated by the side lever. The pinion engages with a skew-cut segment carried on

European Fashions in Closed Bodies



FROM TOP TO BOTTOM—CLEMENT CHASSIS FITTED WITH UNDERTAKING BODY WHICH CARRIES FOUR COFFINS. ROLLS-ROYCE WITH FORE-DOOR LIMOUSINE BODY. FIAT AS A LANDAULET. SHEFFIELD-SIMPLEX LIMOUSINE

the longitudinal shaft, the other end of which carries the cam for expanding the brake shows. Adjustment for wear as well as for applying the braking effort, is provided through two circular flanged faces.

The outer of the two flanges is secured to the shaft by a pin going right through the boss of the flange and through the shaft. The inner flange is integral with the sleeve carrying the skew gear and is secured to the pinned flange by a single bolt. In one flange there are five and in the other six holes; thus by rotating one flange in relation to the other, a very fine adjustment can be obtained. It is an application of the principle commonly applied to magnetos. There is a tendency to put both sets of brakes on the rear wheels, side by side, both being of the internal expanding type. It is also becoming common practice to rib the rear wheel drums. This also applies to the footbrake, which is of the internal expanding type within a ribbed drum. Renault has made this change for the present season. The size of brakes has increased considerably.

Star's Small Car

As an evidence of the trend in Europe and particularly in England toward the small car may be noted the 10-horsepower four-cylinder model which has been added to the Star line for 1913. This new light car makes the third model of the Star series, the other two being the comparatively moderate sizes of 12 and 15 horsepower respectively. The new model is intended to meet the requirements of the large class in England for whom relatively few British cars have been provided and which has formed the greatest selling field for the low-priced American car.

The power plant of the new small car is a unit construction following what has been an increasing tendency in European design. The engine, clutch housing and gearbox are built up as a unit, bolted to the frame by two arms, one on either side of the crank chamber and supported by swinging bolts at the rear end, providing three-point suspension. The four-cylinders are a block casting of the L-type with inclosed valve stems and springs. The motor is of the long-stroke type, its bore being just over 2⅞ inches and its stroke 4 11/16 inches. Thermo-syphon water circulation is used for the first time in this company's products. There is a removable water dome above the cylinder. Forced feed lubrication through a hollow crankshaft is employed, the oil reservoir consisting of a large sump at the bottom of the motor. There are no pipes for oil outside the motor as all oil leads are formed in the tank chamber casting. A leather-faced cone clutch and a ball-bearing three-speed gearset and ball-bearing rear axle are the features of the transmission system. The service brake is located on the transmission at the rear of the gearset and the other on the rear wheels. The wheelbase is 98 inches and the tread is the comparatively narrow one of 51 inches. The chassis alone weighs 1,200 pounds.

In spite of the fact that the six-cylinder motor has made little advance in Europe during the past 12 months, like America they have turned to the light six on the continent, going even further in this respect than has been attempted in America. The chief of the light brigade in sixes is the new 13.4-horsepower six-cylinder Loreley car. This is a German product designed to sell in the neighborhood of $1,500, which probably approaches the record for six-cylinder cars. The cylinder dimensions are 2⅜ inches bore by 3⅝ inches stroke, a size which would ordinarily be considered little more than a toy even with six-cylinders. The cylinders are of the L-head type with gear-driven camshaft and the exhaust pressure is employed for fuel feed. The power plant is of unit construction and the motor other than its size follows conventional lines. A three-speed gearset is used which on the direct drive is geared 5 to 1. One of the details of design is the sprag which works on a ratchet on the transmission brake drum. The speedometer drive is arranged by a pulley from the forward end of the propeller shaft.

Austin cars appear for next season in four different chassis models rated at 10, 15 and 18-24 horsepower with four-cylinder engines and the 50-horsepower model with a six-cylinder engine. Austin motors are one example as the discontinuance of monoblock construction in favor of the separate-cast cylinders. Originally cylinders were cast separately, then the unit form was tried and later abandoned, 1913 cars having the old style of single cylinder casting. Motors are all of the T-head type with twin exhaust manifolds. A feature of the transmission is the internal type of cone clutch which has a segmented periphery to obviate the chance of grabbing. Four-speed gearsets are employed on even the 10-horsepower model.

English makers have not been hasty in the matter of electric lighting but the Austin cars appear this year with a dynamo lighting outfit. The armature of the generator is driven from a countershaft which in turn is driven from the end of the camshaft.

Crossley Unit Power Plant

Crossley cars for 1913 show practically no changes in design from that of the present season. The most popular model is the smallest one rated at 15 horsepower. The power plant in this car is an interesting example of unit system of construction. The engine is four cylinders of monoblock type and the gearset is bolted to a flange on the base chamber by

Nash General Motors' Chief

Head of Buick Company Chosen to Succeed Thomas Neal as President of Big Holding Concern—Old Directors Re-elected at Annual Meeting Held in Jersey City

NEW YORK, Nov. 19—At the meeting of the stockholders of the General Motors Co., held today in Jersey City, all the old directors were re-elected save in the case of C. W. Nash, who was added to the board. The annual report, as already published in Motor Age, was presented.

The directorate consists of the following: Joseph Boyer, Anthony N. Brady, Emery W. Clark, W. C. Durant, Andrew H. Green, Jr., J. H. McClement, Edwin D. Metcalf, M. J. Murphy, C. W. Nash, Thomas Neal, James J. Starrow, Albert Strauss, Nicholas L. Tilney and Jacob Wertheim. The board contains the same representatives of the financial interests that took hold of the company after 1910. It is thought the company will continue its policy of concentration of interests. Already the manufacture of the Elmore and Marquette have been discontinued and it is believed that eventually the General Motors' interests will be confined to four or five pleasure car plants and one devoted to trucks.

Charles W. Nash, who was chosen to a place on the board of directors at today's meeting in place of J. N. Wallace, was elected president of the corporation at the subsequent meeting of the directors. Mr. Nash succeeded W. C. Durant as general manager of the Buick after the reorganization and will continue in that special capacity. Thomas Neal, retiring president, will remain on the board and will continue as head of the finance committee of the corporation.

The various changes signify that the affairs of General Motors are progressing regularly and that the pressing need for a financial and industrial specialist at its head has abated.

Mr. Neal took the office with the understanding that he would be permitted to retire as soon as the business was re-established on a satisfactory basis. The financial report of the company recently issued to stockholders shows that this time is ripe and that the business is in splendid financial condition with a net earning of 17 per cent on the common stock during the last year. In fact, there was general satisfaction expressed over the report by the stockholders who attended the annual meeting.

means of an extension that serves as a housing to partially inclose the flywheel and clutch. The power plant has the three-point suspension, the front support being in the nature of a journal which holds a tubular shaft-like extension of the crank chamber through which projects the starting handle. A tubular member of the main flange which passes through a rigid braeket cast integrally to the gearbox provides the second and third points of suspension. The cylinder size is 3⅛ inches bore by 4¾ inches stroke. The camshaft is driven by a silent chain with an adjustment for tension and timing.

Transmission Brake on Napier

There is little change in the Napier series for the coming season. The two most popular models of this line are in four-cylinder 15 and the six-cylinder 45-horsepower chassis. The 15 is another example of unit construction of power plant, comprising a four-cylinder engine with the flywheel in front and the multiple-disk clutch in the gearset housing. The motor is of the L-head type with 3¼ by 5-inch cylinders. Arrangements are made by which the steering column can be set at any angle desired and the angle of the brake and gearset levers are also adjustable. The European method of carrying the service brake on the transmission is employed in this car. The brake consists of a large steel flange drum attached to the main shaft of the gearset and carrying two projections that form one of the forks of the universal joint. The brakes used are pivoted for 1913 at their centers to suspension levers as in railway practice. A dust shield is fitted to protect the brake and universal and a thumb screw outside the shield provides adjustment. The Napier company is one of the few manufacturers still retaining the steering tie rod in front of the axle instead of its almost universally adopted position behind the latter.

Unit construction of the power plant is carried out in a novel way in the Arrol-Johnston car. These are shown in three models, 11-9 and 15.9-horsepower four-cylinder models, and a six-cylinder model 23.8 horsepower. The chief feature of all three models is the unit construction of the motor and gearset which, however, differs from most of this type by having a common base for the two elements. This base is an aluminum casting which extends from the starting handle to the rear end of the gearset. It is bolted direct to the main frame and assists in stiffening the entire chassis. Four-speed gearsets are provided even in the smallest model.

The feature that attracted the most attention to the Wolseley car is a new engine starter of the compressed-air type designed and made at the Wolseley works. The starter consists of a two-cylinder air pump driven off the transmission countershaft which maintains a pressure of about 300 pounds in a storage tank. When this pressure is reached the pump is thrown out of gear by the driver. From the air tank the compressed air reaches the cylinders through a distributor valve on the forward end of the camshaft. A by-pass is fitted from the main valve for tire inflation or the operation of the pneumatic jack.

Latest in the Talbot line is another small car, this one the 12-horsepower model with cylinders 3⅛ by 4½ inches bore and stroke. There is another four-cylinder car of medium size called a 16 and a six-cylinder 20 with cylinders of the same sizes as the 12. A feature of the Talbot chassis is the strength of the frame, the outcome mainly of severe trials in the colonies. The side members of the frame are extra thick and the underframe and several channel cross members give great rigidity. All models are provided with spare wheels and there has been added this year a particularly neat device for carrying them. The wheel rests in a groove in the running board and is held in place there by a light bracket projecting from the gearshift quadrant and passing through the center of the hub to steady it.

Most important among the improvements of the Daimler line is in regard to the lubrication. The Daimler system comprises a system of plunger pumps which draw oil from the sump and four of them force the lubricant up the troughs in the path of the connecting rod ends. These troughs are raised and lowered by opening and closing the throttle. The fifth pump has until now been used to force oil to a sight indicator on the dash board but in the 1913 engine the oil from this plunger is taken to a shelf on the left side of the engine and runs thence by leads to the five main crankshaft bearings. To provide an indicator, an exterior spring plunger is fitted in the oil circuit between the fifth pump and the shelf. Depressing the plunger opens a valve and the oil spurts out.

Humber's New Motor

Two newly designed engines are the features of the Humber cars for 1913. These are fitted to the 11-horsepower and 14-horsepower cars. The interesting part in the design of the motor is the casting of inlet and exhaust manifolds in one piece. This casting being bolted on to a side of the monoblock engine casting by eleven bolts; also the lower water pipe elbow is formed as a single casting integral with the timing gear cover plate and fan bracket so that the one piece of metal does treble duty. Exterior piping is, therefore, reduced to a minimum. Another peculiar feature is the frame which is narrow until just behind the front seat where it widens out very perceptibly.

U. S. M. Co. Sale Date Set

Court Signs Order Naming January 8—Formal Bids for One or More of the Six Parcels Will Be Received—Flanders Project Progressing Favorably—No Contract Signed

NEW YORK, Nov. 18—Under decree of the United States district court, the United States Motor Co. will be sold January 8 in New York. Judge Charles M. Hough signed an order to that effect today when the final form of the decree of sale was submitted to him. The changes were of a trifling character.

Under the decree, formal bids for any one or more of the six parcels into which the assets have been divided may be submitted, accompanied by an earnest of good faith in the shape of cash or certified check. The bids thus submitted may be revised upward at the option of the bidder at any time before the closing of the sale at 3 o'clock of the day set.

The action of the creditors appears to be practically unanimous as to the acceptance of the proposed plan of reorganization. On Monday, November 18, 94 per cent of the claims, based upon the total amount, had been filed with the official depositary, the Central Trust Co. It was announced that at least 4 per cent more would probably be filed by December 9, which day has been set as a limit for deposit.

This means that out of a total of over $11,000,000 of claims, the reorganization committee now has all but $660,000, and has prospects of getting the co-operation of about $450,000 before the expiration of the deposit period.

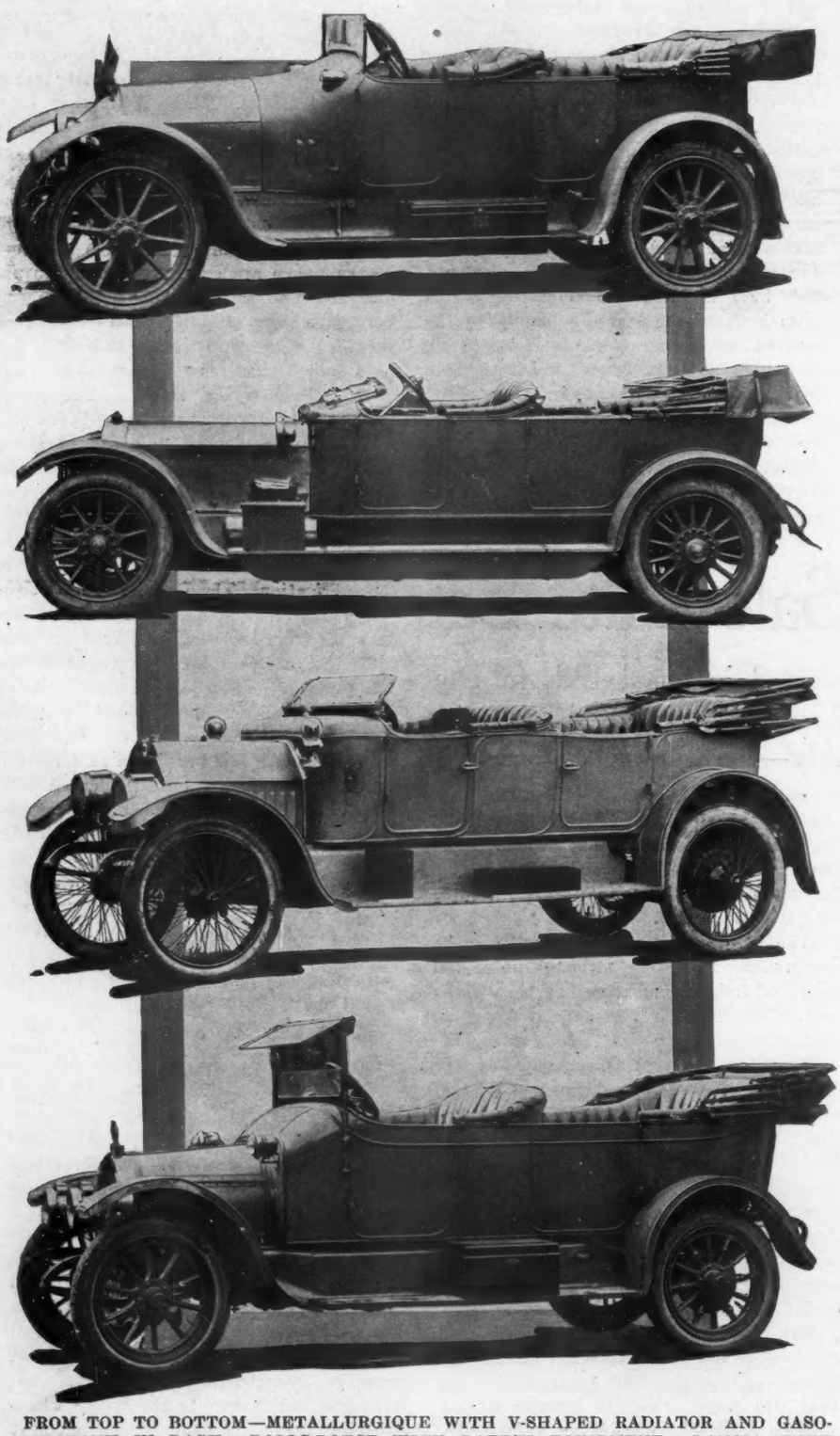
The Flanders project is reported to be progressing favorably, although no official word of its consummation has been given out. The contract has not been signed, but there is a thorough understanding between the parties. This agreement is substantially the contract outlined last week. The precise details have not been disclosed, but it may be said with certainty that the deal is conditioned upon the acceptance of the presidency of the prospective company by Walter E. Flanders as well as the merger of the Flanders company.

It is likely that the situation will be sufficiently developed within 3 weeks to make the official announcement.

The deposits of stock are now estimated at over 47 per cent and according to the prevailing opinion, the total percentage that will come in on the assesment plan will be somewhat more than a majority, considering both issues as a whole.

Body Styles as Noted at Olympia Show

One-Fifth of Main Floor Space Devoted to Exhibit of Thirty-Five Coach-Building Concerns Which Offer Many Exclusive Designs—One Hundred Cars in This Section



FROM TOP TO BOTTOM—METALLURGIQUE WITH V-SHAPED RADIATOR AND GASOLINE TANK IN DASH. ROLLS-ROYCE WITH LATEST EQUIPMENT. LANCIA WITH WIRE WHEELS AND DEEP COWLED DASH. THE SPYKER TORPEDO

By George W. Gaidzik

LONDON, Nov. 9—The motor car exhibition at Olympia is one grand opportunity for the student of body design and construction, for nowhere else in the world is it possible to see assembled at one time so many exclusive designs in limousines, limousine-landaulets, cabriolets, torpedo, touring and other body styles; in a word, it might safely be said, that for high quality materials, superior workmanship, luxurious finish, lightness, comfort, durability and design, the English motor car bodies are unsurpassed.

One-fifth of the main floor space is devoted to the exhibits of thirty-five coach building firms. There are 100 cars in this section.

Cabriolet the Prevailing Rage

The last word in body style as exemplified at Olympia is cabriolet. A cabriolet is a combination open and closed type of body with a folding top which combines all the protection of a closed limousine type with the lightness and grace of an ordinary touring car. With the hood open it is indistinguishable from an elegant touring car; and with the top up it has the outward appearance of a landaulet, with the internal aspect and fittings of a limousine.

Among other marked features with which the American visitor is impressed, might be mentioned the universal presence of the flush-sided fore-door body; the blending of the body lines with those of the engine bonnet, the improvements in fender design and construction as brought about by the adoption of the curved section fender, increasing popularity of the frameless windows, improvements and increased comfort of extra tonneau seats, the incorporation of the fuel tanks in the dash, the popularity of the folding armrest in the center of the rear seats of inclosed cars, the fitting of cocoa-mats on running boards opposite doors, and the many detailed improvements in the arrangement and design of illuminating facilities, acoustiphones, and baggage facilities.

Trimmings and Upholstery

As for the interior trimmings and upholstery of the limousine cars, it seems that the padded-cell effect is extinct in up-to-date coach-building practice, and the interior sides and tops are now lined either with plain or fancy cloths or finished fancy wood work with inlays and quarterings of various patterns.

Where the tube acoustiphone is employed, the tube passes under the floor instead of along the inside of the top, and the horn portion is carefully arranged so as to be almost opposite the driver's ear. A marked improvement over the tube design is claimed by those who now are installing the electric telephone instead of the speaking tube; for it is stated that

Cabriolet Type Has the Call in Europe

Combination Open and Closed Body With Folding Top Most Prominent in Olympia Show—Interior Decorations Mostly Plain or Fancy Cloth or Finished Woodwork

the electric telephone type has eight times the intensity of sound transmission.

Limousines, landaulets, and cabriolets are equally luxurious; glass panels are partially covered with silk curtains fringed with tassels. Hat and package racks made from silk cords are fitted in the tops of enclosed cars; and one limousine with a deep cowled dash has a strong cord net strung under the cowl for the storage of small packages gathered or carried by the driver and front seat passenger. Sling arm rests are very much in evidence.

Many Novelties Seen

Many novelties are to be seen in the way of cabinets in the partition between the tonneau and front seats: one maker has a long slender cabinet in each forward corner of the tonneau; these are termed wine cabinets because they are particularly adapted for carrying a large bottle. Another maker has the center portion formed to represent a miniature hall clock with the lower portion forming a small luggage compartment.

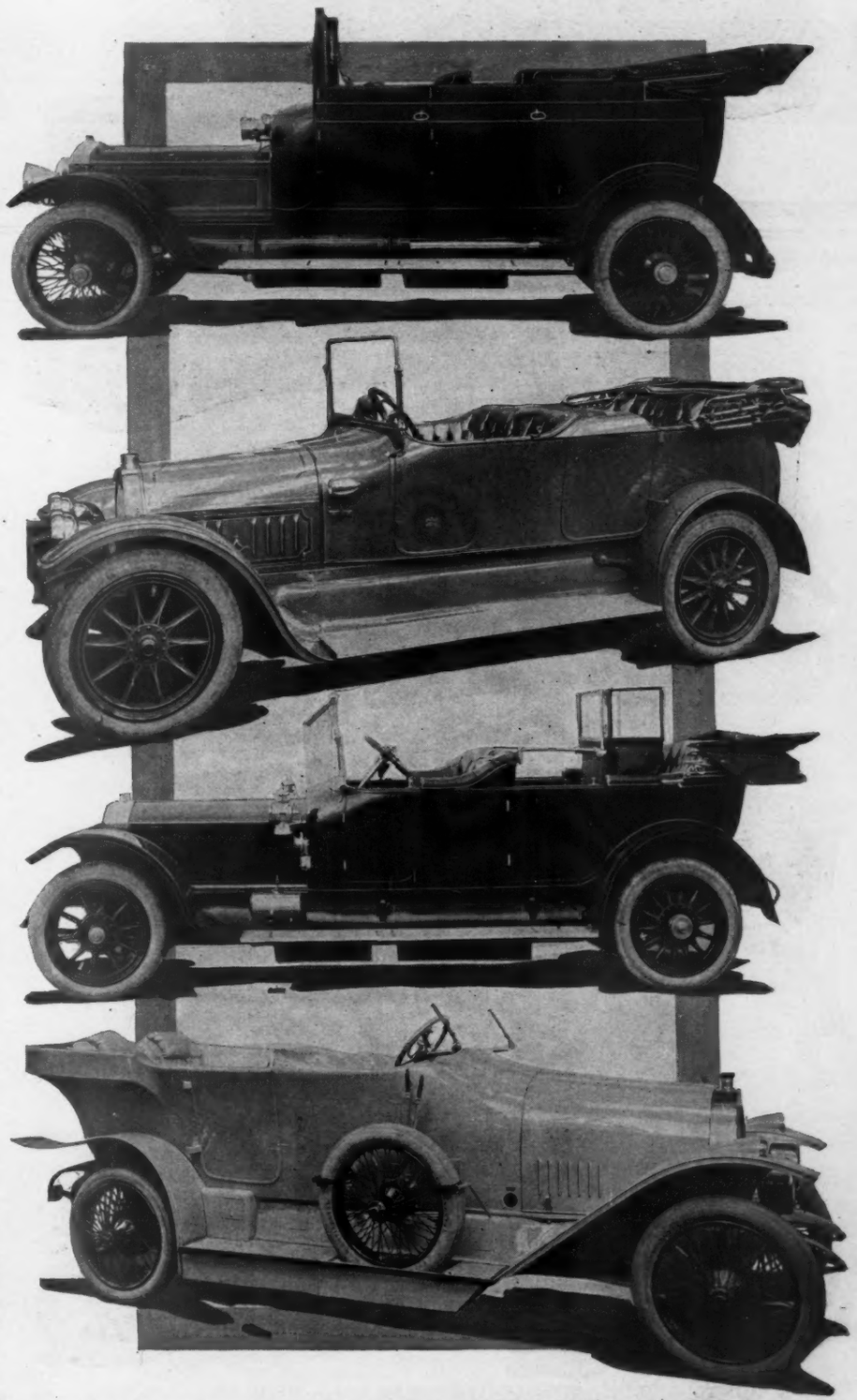
Ventilators of various kinds are fitted; and almost all bodies are equipped with them.

A very popular type of folding seat is one which folds into a very convenient recess in the partition between the tonneau and front seats; and which can if desired be readily removed from its position and placed in a bracket just behind the tonneau door pillar; thus these seats may be placed so that the occupant may ride backwards with the back rest against the front partition, or forward with the back just in front of the occupant of the rear tonneau seat. These extra seats are very comfortable and provided with arm rests.

The question of whether the body shall be of wood, steel, or aluminum is settled between the coach builder and the motor car manufacturers and builders of motor car bodies. The coach builder is a strong advocate of the wooden body; the motor car manufacturers who have undertaken to build their own bodies are in favor of the aluminum construction, and sheet steel is employed by some firms whose sole business is that of making motor car bodies.

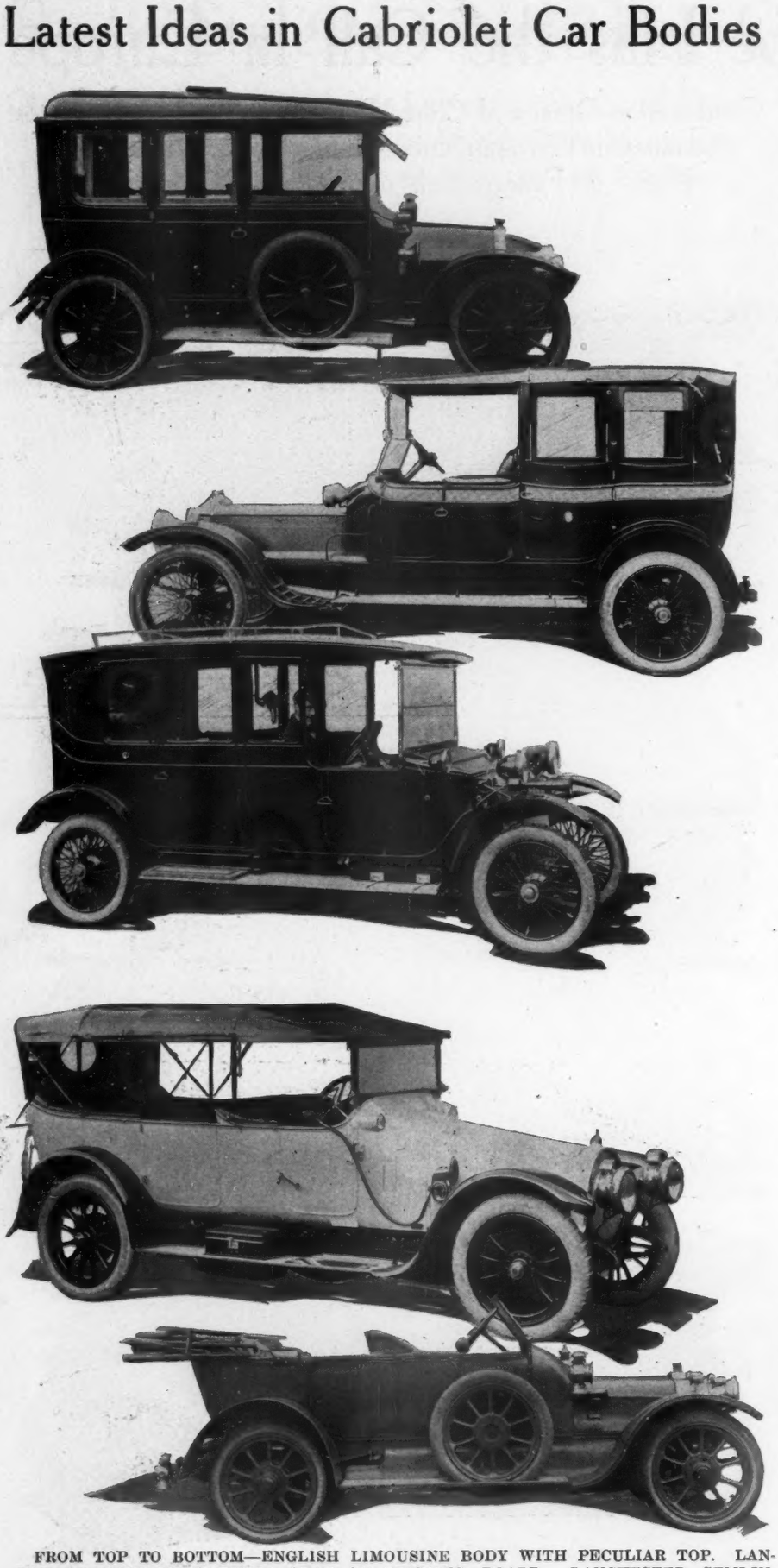
Leather Upholstery Popular

Of the various materials now used in the upholstery of inclosed bodies leathers are extensively used. The japanned leathers are of two classes: The patent leather hides are carefully covered with a coat of japan, which gives a surface like polished glass, impermeable to water, and the hides prepared by a more elastic mode of japanning, which permits folding without cracking the surface, are called hides of enameled leather. Such leather has the japan annealed, something in the same manner as glass; the hides are laid be-



FROM TOP TO BOTTOM—A MULLINER CABRIOLET BODY. EXAMPLE OF FLUSH-BODIED TYPE. ROLLS-ROYCE WITH WINDSHIELD FOR TONNEAU PASSENGERS. ODD CONSTRUCTION WITH SIDES AS HIGH AS TOPS OF SEATS

Latest Ideas in Cabriolet Car Bodies



FROM TOP TO BOTTOM—ENGLISH LIMOUSINE BODY WITH PECULIAR TOP. LANLAULET TYPE WITH EXTRA SEAT ON RUNNING BOARD. LANCHESTER SEMI-INCLOSED LANDAULET. DELAUNAY-BELLEVILLE TOURING CAR. TALBOT WITH TORPEDO BODY

tween blankets, and subjected to the heat of an oven at a temperature of 150 degrees Fahrenheit for several hours. The enameled hides furnish us with the leather for landaulet and victoria tops, etc. Ox hides may be specially recommended for this purpose and horse hides are also used. Sheep skins are manufactured into the mock or imitation morocco and other colored leathers, and are sometimes used. Goats and kids supply the best quality of light leather, and are the true morocco leather.

Preparing the Leather

The preparation of enamelled and patent leathers is not the same as that of dyed skins such as moroccos. The process of preparation of the leathers was originally invented in Morocco, and for its manufacture the Moors were justly famous, still surpassing all other competitors. They make it extremely soft and white by the use of two species of plants indigenous to the soil, and use red, green, or yellow dyes, remarkable for their brilliancy and durability. The Turks are also famous for the preparation of this leather, in reds or yellows. With respect to other colors, they are surpassed by ourselves.

Wood-Dyed Broadcloths Used

The most durable of the cloths, which are also extensively used in the upholstery of inclosed bodies, are the wool-dyed broadcloths, for which the English are justly celebrated. The colors most durable will be found of the darker shades of indigo blue, and the browns of the umber type; greens and clarets are not so reliable, while the nature of their dyes seems to impair slightly the strength of the material, black being in that respect the most remarkable. Drabs and grays

Why S. F. Edge Retired

LONDON, Nov. 9—Selwyn Francis Edge has been so closely identified with the trade in Great Britain that the announcement which has just been made of his retiring from the industry has caused some little talk. Mr. Edge is an Australian and his connection with the trade dates from the 1,000-mile trial of the Royal Automobile Club in 1900.

The cause of the retirement is really the settling of a dispute between Edge and Napier firms—for the firm of S. F. Edge Ltd., is not a manufacturing firm, but the sole selling agent for the Napier output. Broadly speaking, the two concerns, which are largely individualized by Mr. Edge and M. S. Napier have been working on the basis of an agreement by which the Napier company sells all its output to the Edge concern. Latterly, disputes have arisen, mainly with the development of the commercial motor business, which is now beginning to assume substantial proportions.

The Napier firm started marketing its own commercial wagons and S. F. Edge joined with Mr. Burford, the late general manager of Humbers Ltd., in the purchase

are least impaired by dyes and may be trusted for their strength as well as color; but discretion should be exercised on their choice, well considering the possibility of their being kept clean, otherwise the darker hues should be chosen.

Besides we have the various descriptions of carpeting, which contribute such an air of comfort, and form the best material to be placed underfoot in all closed carriages. These are of the French, Brussels and Wilton types and designed to harmonize with the general scheme of decoration. The carpets are sometimes used for other purposes than the flooring of cars, cushions, etc., being occasionally made of them: but the coarseness of the texture of which they are formed renders it treacherous material to make up, any but the salvage edges being most reliable.

Silk for Upholstery

Although wool affords some of the most useful of our body trimmings, it will readily be granted that to silk we owe the most beautiful and costly material. Silk bears among materials very much the same superiority that gold does among metals. As it can never be produced in great abundance, it must always be an expensive article. The excellence of silk as a material consists in its strength, softness, lightness, and luster, and its being capable of taking the finest dyes.

Luxurious Devices

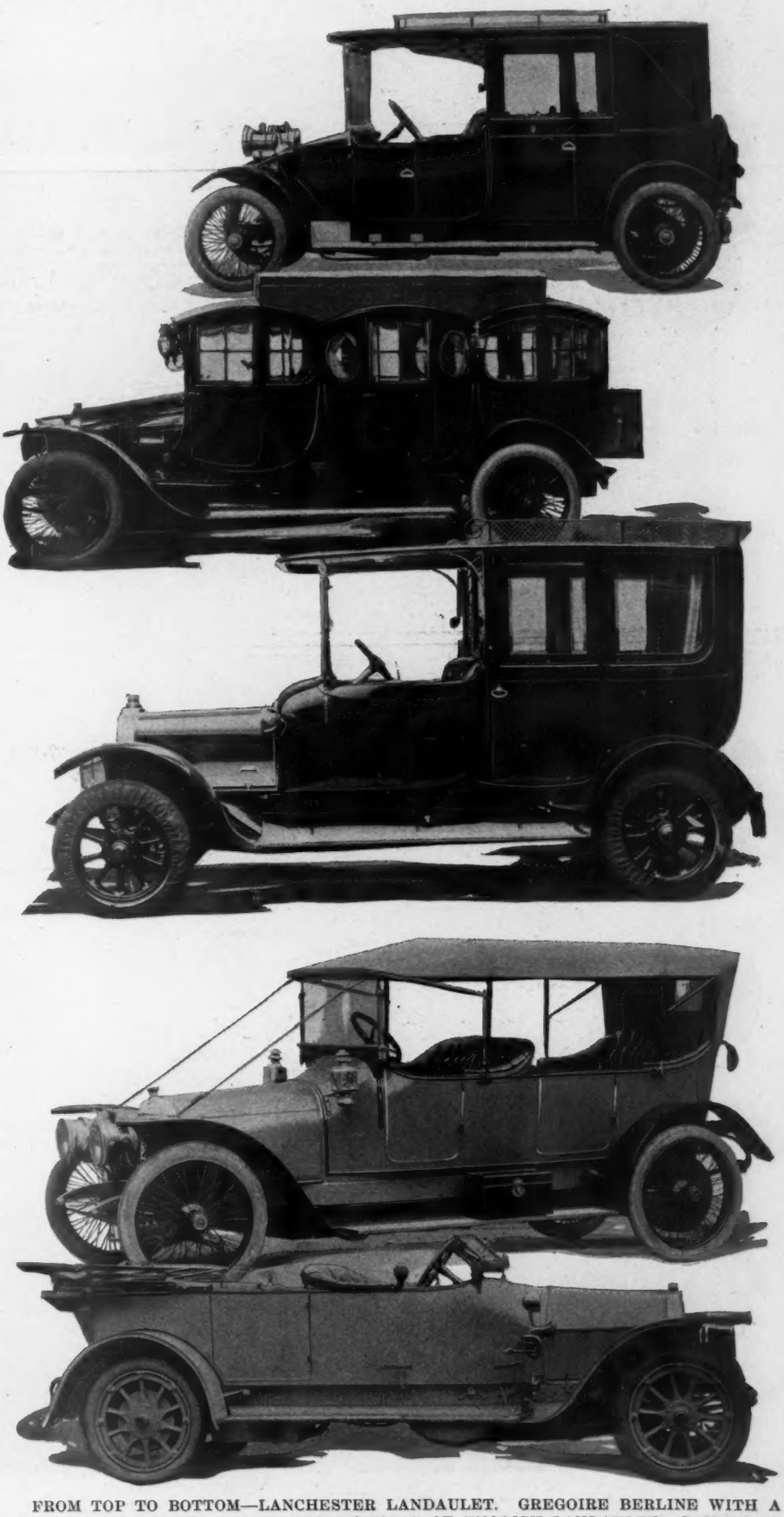
Of the various other contrivances, such as inside fittings with card, glove, cigar-ash and other trays, cases for bottles, arrangements for a carriage clock, looking glass and bouquet holders, etc., speaking tubes, coat hooks and umbrella holders, there is no need to write of at length here.

From the British Trade

of the Lotis plant of Sturmey Motors Ltd. and started building commercial wagons. Actions were entered between the two firms on this and other counts. These actions have now been settled by Mr. Napier buying out the Edge interests in all three concerns, Mr. Edge undertaking to have nothing to do with car manufacturing or selling for a period of years.

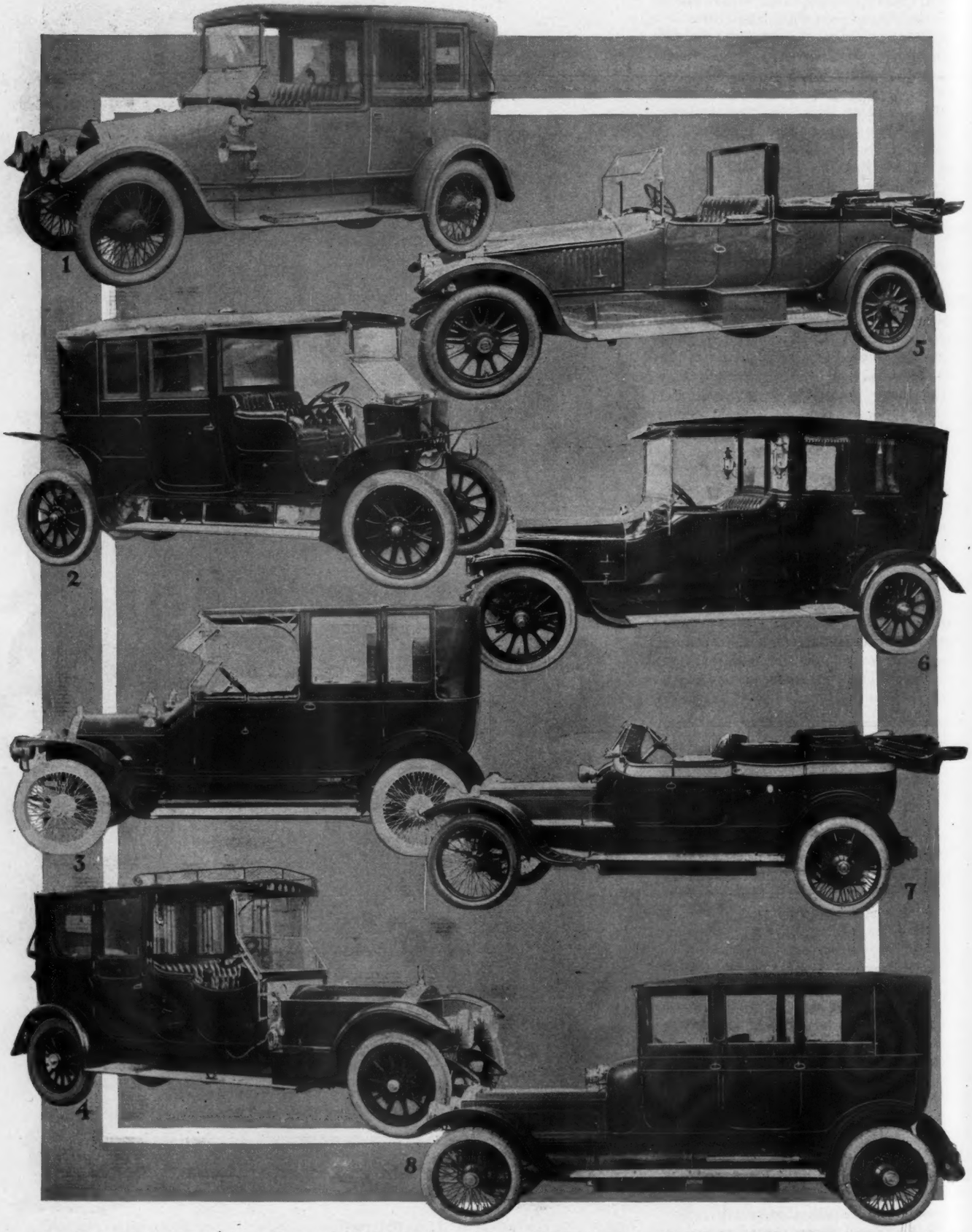
It is understood that the purchase of the Edge interests ran into a matter of $825,000 and Mr. Edge is reputed to retire from the business with about $1,250,000 to his credit. The motor industry, however, will not lose Edge's interest, as it is understood he has parliamentary views and as he is a strong tariff reformer he may be expected to harp upon that string as assiduously as in the past he has boomed the Napier interests, so that, from this point of view, his future career will still be not un-interesting to the American industry. He will continue to represent S. F. Edge Ltd. on the management committee of Society and Motor Manufacturers and Trades.

Advance Ideas Seen at Olympian Show



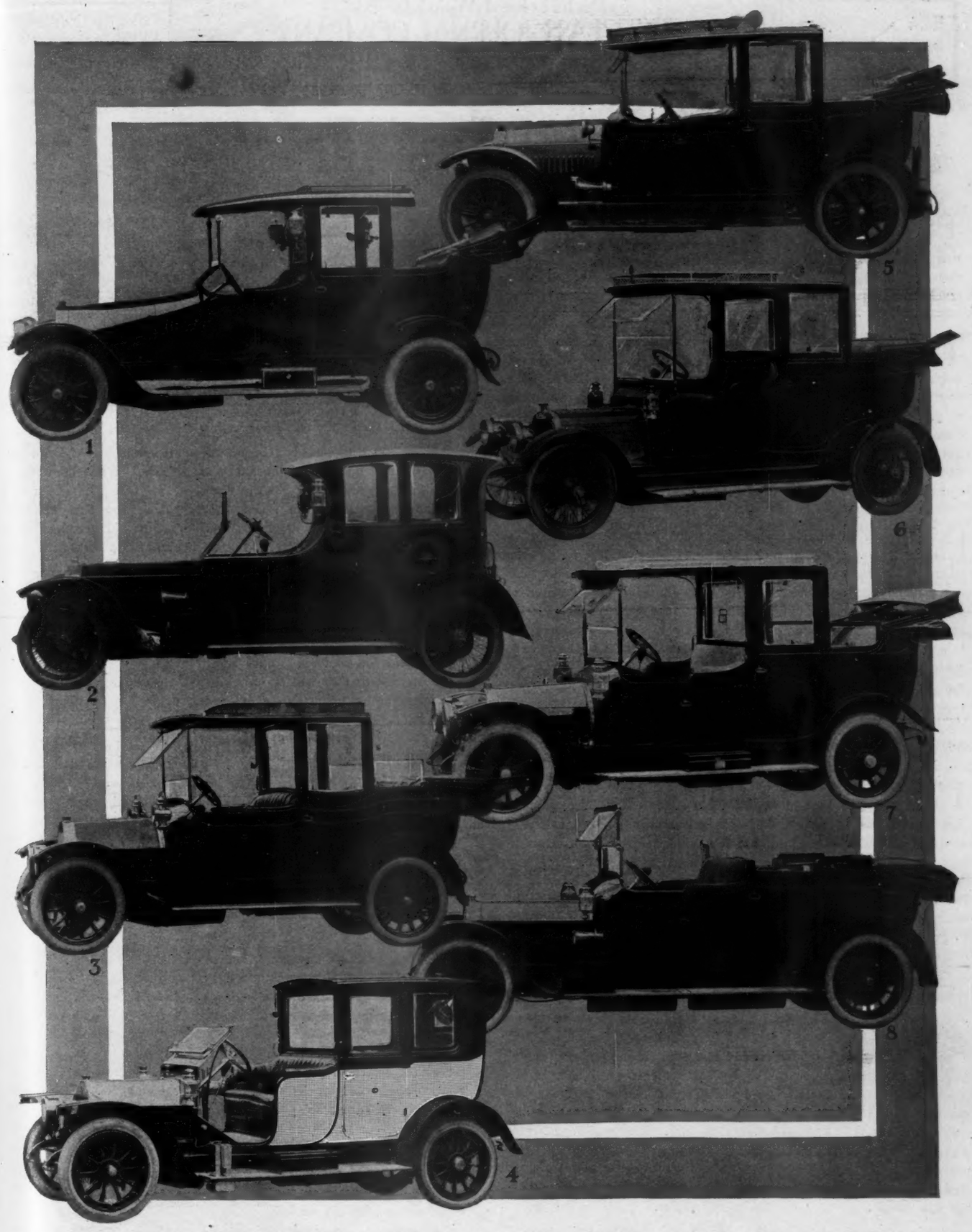
FROM TOP TO BOTTOM—LANCHESTER LANDAULET. GREGOIRE BERLINE WITH A THREE-COMPARTMENT BODY. TYPICAL TYPE OF ENGLISH LANDAULET. PANHARD'S IDEA OF A TORPEDO BODY. LANCIA AS A TORPEDO TOURING CAR AS EXHIBITED AT THE OLYMPIA SHOW

Types of Body Work as Seen at Olympia



1—ARMSTRONG-WHITWORTH 17-25-HORSEPOWER MODEL. 2—ENGLISH BODY WITH DASH OVER ENGINE. 3—15-HORSEPOWER NAPIER LANDAULET. 4—40-50-HORSEPOWER ROLLS-ROYCE. 5—VAUXHALL CABRIOLET. 6—FASHIONABLE ENGLISH LIMOUSINE. 7—CABRIOLET WITH TOP DOWN. 8—FORE-DOOR LIMOUSINE OF ENGLISH MANUFACTURE

Foreign Cars Suited for Any Weather



1—LANDAULET WITH STREAM-LINE BODY. 2—ANOTHER ROLLS-ROYCE CREATION. 3—FIAT LANDAULET WITH BAGGAGE-CARRYING SPACE ON TOP. 4—CLOSED BODY WITH WICKER SIDES. 5—LANDAULET TYPE WITH ROOM FOR LUGGAGE ON TOP. 6—ONE OF THE PANHARD MODELS. 7—SPYKER LANDAULET. 8—A ROCHET-SCHNEIDER

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Advice for Truck Buyers

"The business man who buys motor trucks should not buy on a basis of free repairs, rather on a basis of no repairs."
"When purchasing a motor truck the buyer should not aim at buying foolish warranties, but legitimate service."

THESE two extracts from an address delivered before the National Association of Automobile Manufacturers at its first annual convention in Detroit last week should be hung up in the memory of every business man who expects to purchase motor trucks within the next 2 years.

THE buyer of motor trucks has been about as much to blame as the truck salesman and the truck maker for many of the regrettable sales of the last few years. The buyer has in not a few instances insisted on life or 7-year guarantee; the buyer has in some cases insisted on the stockholders of the manufacturing company personally underwriting the long guarantee; the buyer has insisted on free repairs covering the life of the truck; and the buyer has insisted on overloading his truck 50 per cent and overspeeding it to nearly the same extent.

IN opposition to this has been the truck maker, who in quite a few cases has accepted such dictation. Many cases can be cited where a branch manager or truck dealer was overpleased at making a demonstration where the would-be purchaser had insisted on a 50 per cent overload and with speeds that would beat those of every other demonstrator. Such a dealer is an equal criminal in this disastrous work of motor truck destruction. But the dealer made the sale, boasted of it and then—well, within a year he was looking for other positions, he had sold his agency to the bankruptcy party and the truck buyer had a sadly ruined machine on his hands: A machine of good caliber but overloaded and overspeeded to an untimely dissolution.

THE truck buyer wants daily to kill the goose that lays the golden eggs. He knows from his sane fellow business man that motor trucks eclipse horse transportation when rationally used and he vainly imagines that the same trucks can be irrationally used. He is right. They can be irrationally used. But why does this business man desire to use them so? Solely because he has the written promise from the truck dealer or maker that he will give him free repairs and he immediately makes up his mind to get all he can out of the truck, knowing full well that it will not cost him anything additional.

THIS is the real yet horrible nightmare condition that not a few truck builders have awakened to find themselves in. They are manacled by a monster of their own breeding and rearing. They have sold their business body and soul through absurd guarantees, guarantees which might be legitimate if the truck owner would be rational, but he has made the purchase to find what is the maximum of the truck capacity, knowing full well that he has free experimental privilege offered to him. Every time a truck maker or truck dealer makes such a bargain with a so-called business man, he is tying a millstone around the neck of his company. Ostrich-like, he may bury his head but the reality remains and the day of reckoning comes closer and closer.

THE business man, who is honest with himself, will not buy motor trucks on such a foolish basis. The broad-minded business executive knows that such business policies are the short cuts to financial suicide. He has had enough experience in other lines of business to know better than to take such disastrous courses. He knows that not a single line of business can be successful unless money is made; and in the same breath he realizes that a truck maker or a truck dealer cannot make money when he gives the buyer his entire commission and in addition makes a 45-weeks free demonstration, guarantees free repairs, free inspection, free overhauling and many other free-list items. Such wholesale cutting of profits and abnormal guarantees instead of serving to increase confidences destroy them.

A BUSINESS man can better be appealed to on business lines than on cut-price, guarantee arguments. What he wants is truck service and not useless guarantees; what he wants is a well-designed, honestly-made truck, incorporating the best materials and the best design and closest workmanship and not poor materials, questionable designs and poor workmanship with life guarantees and free repairs.

THE truck maker who puts the best engineering design obtainable into his truck; who purchases only the most approved materials; and has nothing but the closest working to limits throughout his factory, cannot afford to give life guarantees and free repairs, neither will he have to give them. On the other hand the maker who for a few short years, or perhaps months at the longest, aims at building up a business on free repairs and life guarantees cannot put the best material, the best design and best workmanship into his trucks.

THIS editorial is for the truck buyer, not the truck dealer or truck manufacturer. It is for the buyer who buys on a business basis, for the buyer who wants to get the most for his company from the fleet of motor trucks or the individual trucks which he purchases. This buyer must remove the bandages from his eyes and stop stumbling over the mote in the dealer's eye and leaving alone the beam in his own eye.

IF he is a business buyer he will not be interested in life guarantees or free repairs, but will be interested in the stability of the organization back of the vehicle; will be interested in the legitimate business policies of the truck maker and also the truck dealer. He will recognize that it is money in his pocket to pay the dealer the list price, that it will be money in his pocket to have that dealer in business and doing well 5 years hence, because he will need more trucks and more advice on trucks. That dealer cannot be in business 5 years hence if he sells on the basis of life guarantees, cut prices and free repairs.

THE business truck buyer must make more of a systematic study of motor transportation than he has in the past. He must not confine his study solely to the truck but to his transportation systems. Is his driver operating at horse-pace or at motor pace? Let him ask himself this question and then turn the spot light upon his own systems and see where he stands.

France Tries Out Splash-Guard Ideas

First Prize in Unique Contest Given to Garchey's Device

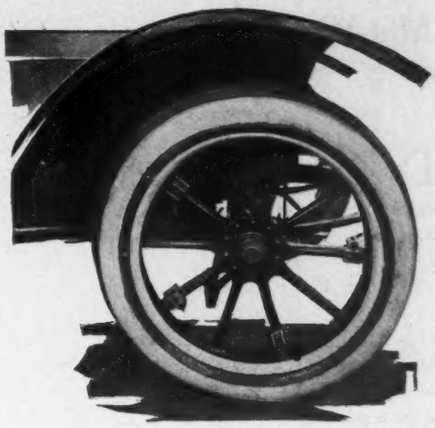
GARCHEY, FIRST PRIZE

PARIS, Nov. 5—The city fathers are of the opinion that they must protect foot passengers against the mud-flinging proclivities of rubber-tired vehicles. Thus the Paris General Omnibus Co. has opened a competition, having united 400 applicants, the best of which will be asked to take part in a practical test, and the Automobile Club of Seine and Oise has just held a competition in the city of Versailles.

To test the ability of the splash-guards to remain attached to the wheels, the competing vehicles were first sent on a run from Versailles to Chartres and back, a distance of about 80 miles. There were no failures under this heading. Contact with the edge of the curbstone next followed, points being awarded in proportion to the ability of the appliances to withstand this kind of treatment. The most important test was a run over a mud track at a speed of not less than 18 miles an hour, the track being lined with big white canvas boards divided into squares to show the projections.

On a totalization of points the most successful appliance was the Garchey. It went over the track at more than the minimum speed imposed, but threw up practically no mud, although the boards were not more than 18 inches from the wheels. The appliance consists of two circular guards of rubber and canvas fitted on light rims and placed on the outer and inner face of the tire. This apparatus was the only one protecting both faces of the tire, and it is to this fact that it owes much of its success. In many cases the outer guard was really effective, but it caused the mud to be flung to the opposite side, and when in a liquid condition it passed through the spokes or around the wheel on to the board.

Second prize went to the Menu guard. This also was of the circular type, consisting of one of the walls of an old tire, fastened to a special rim and attached to the wheel of the car. In last year's competition this apparatus also won second prize. Third prize went to the Dreux brush type of guard. The brush was swung from the hubcap and prevented from oscillating by a vertical stem going through the mudguard. The bottom row of squares were splashed irregularly, but no mud rose to a height of more than 4 inches from the ground.



MENU, SECOND PRIZE

The Malraux, which secured fourth position, was of the usual circular type, but was distinctive by reason of the elastic bands hooking to the splash guard rim, going round the spokes and returning to the rim. It lost points on the appearance test. The Couvreux, coming next in order of merit, was another circular rubber and canvas type, with the guard rim screwed up to the spokes of the wheel. On the Gruyelle brush type, with the brush hanging from the hub cap, there was difficulty in preventing one of the brushes swinging, with the result that big quantities of mud splashed at intervals.

Jaugey used a semi-circular guard, the lower portion composed of rubber and canvas and the upper portion consisting of sheet metal with its outer edge curved inwards to prevent splashes coming over the top. It gave good results on the splashing test. The next three were all of the circular type, differing only in the manner in which they were attached to the wheel. The Haywaert and the Frainier, both brush type, had the common defect of allowing mud to reach the bottom row of squares.

DREUX, THIRD PRIZE

MALRAUX, FOURTH PRIZE

Coming Motor Events

November 23-24—Track meet, Fresno, Cal.
November 28-29—Track meet, Richmond Automobile Club, Richmond, Va.
December 2-3—Annual meeting American Automobile Association, Chicago.

SHOWS

November 16-23—Atlanta, Ga.
November 26-30—Show at Grand Rapids, Mich.
December 7-22—Paris salon.
January 2-10—Importers' Salon, Hotel Astor, New York.
January 4-11—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia.
January 20-25—Milwaukee, Wis.
January 22-25—Geneva, N. Y.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Montreal, Canada.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
January 30-February 1—Canandaigua, N. Y.
February 1-8—Chicago.
February 10-15—Chicago truck show.
February 10-15—Minneapolis.
February 11-15—Ottawa, N. Y.
February 15-22—Newark, N. J.
February 15-22—Albany, N. Y.
February 16-23—Richmond, Va.
February 17-22—Kansas City.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
February 24-March 1—New Orleans, La.
February 26-March 1—Fort Dodge, Ia.
March 3-8—Pittsburgh.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo.
March 19-26—Boston truck show.
March 24-29—Indianapolis.

Many Topics Discussed by N. A. A. M.

Mid-Winter Meeting in Detroit Brings Out Large Attendance—Freight Car Situation Receives Attention—Manufacturers' Contest Association Wound Up—Commercial Vehicle Problems Come Up—Interesting Papers Presented at Different Sessions

By L. V. Spencer

DETROIT, Mich., Nov. 16—Business of importance was transacted at the first mid-winter meeting of the National Association of Automobile Manufacturers which convened in this city at the Ponchartrain hotel on Thursday and Friday.

Of vital interest to the industry was the conference with the railroad men relative to the freight car famine and it is expected that the talks will result in a general improvement of conditions. The demise of the Manufacturers' Contest Association was forecasted by the announcement that the N. A. A. M. is willing to appoint a contest committee to work with the American Automobile Association. The merger of the N. A. A. M. and the Automobile Board of Trade came up in the appointment of a committee to investigate the matter, while the executive committee also transacted important business.

It is doubtful if the association ever held a more successful meeting, in the light of the large number of prominent manufacturers who were present, the fund of valuable knowledge which was imparted, the important business transacted and the results accomplished.

The convention really was officially opened on Wednesday with a meeting in the afternoon of the executive committee of the association, composed of W. E. Metzger, president; S. D. Waldon, W. C. Leland, R. D. Chapin and Hugh Chalmers, Detroit; W. T. White and L. H. Kittredge, Cleveland; Alfred Reeves, New York; H. H. Rice, Indianapolis; G. W. Bennett, Toledo, and S. A. Miles, Chicago. However, it was not until Thursday morning, when the general sessions commenced, that the greater number of the members arrived.

Papers Read Second Day

This second day was taken up with the reading of various authoritative papers and discussions, while in the evening the Detroit members tendered to those from out of town and to other invited guests a most enjoyable banquet in the auditorium of the Pontchartrain. About 250 attended the affair, and in addition to the many interesting speeches a variety of entertainment was provided. A. E. Larned, former president of the Detroit board of commerce, acted as toastmaster, while at the speakers' table were Henry Ford, Hugh Chalmers, W. E. Metzger, H. B. Joy, Thomas Henderson, L. H. Kittredge, R. E. Olds, H. O. Smith, Hal Smith, James Keena, George T. Moody, L. W. Goodenough, J. C. Wetmore, E. B. Boyd, Nat Duke and J. N. Willys.

On Friday morning, several more papers were presented, and in the afternoon an important conference between leading representatives of the railroads and the members brought the actual business of the convention to a close.

A number of the visitors remained over until today in order to visit some of Detroit's many interesting car and parts factories.

The Detroit committee on arrangements for the meeting was composed of William E. Metzger, Flanders Motor Co.; Hugh Chalmers, Chalmers Motor Co.; S. D. Waldon, Packard Motor Car Co.; R. D. Chapin, Hudson Motor Car Co.; W. C. Leland, Cadillac Motor Car Co., and H. W. Ford, secretary Chalmers Motor Co.

Business of the Convention

The first speaker on the program at the opening session on Thursday morning was S. A. Miles, general manager of the National association, who outlined its past work, its present objects and its future. He explained the reasons for holding the convention at this time when manufacturers are not busy with shows. Meetings held during the show season do not furnish the members a suitable opportunity to get together, to know each other and to ascertain what is going on in the association and in the world of motoring, and to get out of the association the full benefit of the advantages it offers.

In his talk, Mr. Miles considered the history of the association for the special benefit of the newer members. The association was organized November 10, 1900, at the first show held in New York. The first executive committee meeting was held on December 3, 1900, and the body was incorporated May 4, 1904. The industry then was a mere dot in the world of commerce. There were about a dozen manufacturers, a few experimenters and a few importers. But these energetic pioneers formed their association at a period of the trade's existence which surprised men in older lines of business.

Mr. Miles traced the trials and tribulations of the National association during the days when the Selden patent was in force. Although the association never had any connection with either the licensed or unlicensed faction, and had in its ranks members of both sides, it was the victim of circumstances and with the formation of the two rival bodies commonly called the licensed and the unlicensed associations, it became a house divided against itself, though it did not fall. Since the reversal of the court decision and the abandonment of the licensed association, the National association has regained much of its former strength, although it is not yet, as it once was, the sole representative of the trade.

Another body, known as the Automobile Board of Trade, has been formed, and much of the work of the two organizations now existing is duplication. It is hoped that the two can be consolidated, as there is much sentiment in that direction at present.

"No matter whether this can be accomplished r not," said Mr. Miles, "the removal of the barrier between the two classes of members and the return of the National association to power was the signal for results which plainly show the inevitable consequences of co-operation.

"Our freight department, backed by the members and the influence of a united industry, became a real power and its value increased ten-fold. Our commercial vehicle committee became so active that its work is among the most important we have done. Our show committee jumped into the breach and headed off threatened opposition in New York. The membership committee became so active that it has added nineteen members to the roll, so that we have now 105 upon the list, by far the greatest number in our history. Our work became once more aggressive and creative. We have done more good in the last 18 months than in the 7 years preceding."

Miles on Good Roads

Mr. Miles touched upon the work of the good roads committee and on the association's co-operation with the A. A. A., the most notable result of which has been the securing of the appointment of a joint committee in congress to take up the policy of federal aid to the good roads movement. The association has been instrumental in the prevention of the passage of freak and discriminatory laws against motorists and in the enactment of sane registration statutes.

The general manager further reviewed the work of the traffic department, the co-operation with the Manufacturers' Contest Association, the adoption of standard warranties, truck standardization activities and show work. He closed by saying, "The association, like the trade it represents, is stronger, richer and better than ever before; hence we have reason to believe that we shall continue to be more useful with every new year of our existence."

The general transactions of the conven-

N. A. A. M. BANQUET AT DETROIT MEETING

tion resolve themselves into six principal divisions, namely: general business transacted, traffic considerations, commercial vehicle work, yearly model discussion, selling problems and manufacturing. These divisions will be taken up in the order named.

General Business Transacted

Much of the business of the executive committee was of a general nature. Three were admitted to membership, swelling the total to 105. These were August Becker, Lippard-Stewart Motor Car Co.; Buffalo; F. D. Waggoner, General Vehicle Co., Long Island City, N. Y., and H. S. Miller, Lauth-Juergens Motor Car Co., Fremont, O.

The association will conduct a show at Pittsburgh to fill a vacancy of the local show circuit caused by the inability of the two local organizations there to agree upon an exhibition in which the united trade may take part. The association also is in communication with the director of exhibits at the Panama-Pacific exhibition and contemplates the taking over of and the allotment of the space which will be devoted there to the display of motor cars.

The commercial vehicle committee returned a resolution to the executive committee opposing an open-air motor truck show, it having been suggested that such an exhibition be held in the summer or fall of 1913, either as an experiment supplemental to the regular mid-winter show or to take the place of the latter after this winter. It was argued that such a show would give opportunity for the display of trucks in operation and of loading and unloading devices, but the predominance of opinion was that there are enough shows already, and that to introduce a big exhibition between April and December would tend to prolong the show season throughout the year, with its attendant disorganization of the factory forces, which is not desired.

Because of the cancellation of an agreement which formerly existed between the Manufacturers' Contest Association and the American Automobile Association as regards the running of contests, the National association signified its willingness to appoint a committee to co-operate with the contest board of the latter. Up to the time of the formation of the M. C. A., the National association took an active part in the control of contests, and this is practically a step in the reversion to that policy.

Investigating Wood Alcohol

In view of the soaring price of gasoline, the advisability of taking steps toward the bringing about of legislation to remove the ban upon the wholesale manufacture of wood alcohol for fuel purposes was discussed. It is stated that this fuel could be manufactured and profitably marketed at 10 cents a gallon, and many car makers and dealers feel that the association should act to relieve the ban which was placed upon the promiscuous manufacture of wood alcohol at the last session of congress.

Although little is ever heard of the National association in connection with good roads work, nevertheless its influential activities along this line have brought about many improvements in our national highways. The association has a good roads committee of which R. D. Chapin is chairman. It therefore was fitting that a paper on good roads should have been presented by him. Mr. Chapin said in part:

Chapin on Good Roads

"Some years ago, the National Association of Automobile Manufacturers first interested itself in good roads work," said Mr. Chapin. "It appealed to your executive committee, even then, that eventually touring was to become much more common in this country than abroad, where the finest of roads obtain. We knew that good roads were bound to come here, but our aim has been to hasten their construction, to help shape the legislation, both state and national, bearing upon highways, and to study the best types of roads for motor car travel.

"As each of you well know from your experience, our ideas have changed greatly in the past decade. The use of the roads by the tremendous number of motor cars that we all have produced has revolutionized the art of road building. It has given a great impetus to the making of permanent and continuous arteries of traffic. This very construction has in turn stimulated to a great extent the use of our product. It has always been my opinion that the future expansion of our industry is in a great measure proportionate to the improvements in the roads of every state. We have each found that where the highways were good, cars were used in large and increasing numbers.

"Two years ago your committee became convinced that from then forward the car user was perhaps the strongest factor, outside of the farmer, in the securing of good roads legislation. We therefore, in conjunction with the American Automobile Association, organized a good roads board, composed of R. P. Hooper, president of the A. A. A.; A. G. Batchelder, chairman of

the executive committee; G. C. Diehl, chairman of the good roads committee; S. D. Waldon ,representing the Automobile Board of Trade; C. J. Butler, representing the Motor and Accessory Manufacturers, and myself, representing the National Association of Automobile Manufacturers. Our purpose was to co-ordinate the good roads work of the manufacturers and the users, bringing to bear the enormous influence of the organized body of users.

Federal Aid Conventions

"Through the initiative of the A. A. A. national good roads board, the first federal aid convention ever held in this country took place in Washington in January last. It was a notable gathering, country-wide in the complexion of its attendance, and including men who are leaders in the movement in their respective states.

The concrete result of the convention was a resolution adopted by congress, providing for a joint committee of house and senate to take up the federal aid question in its entirety, and to evolve a concise proposition. This joint committee now consists of five members each from the committee on postoffices and post roads of the two branches of congress. With this committee we shall have much to do from this time on.

"Briefly summarized, the A. A. A. plan is for a comprehensive system of national roads to supplement well organized state systems, which shall include inter-county, market and township roads, with adequate provision for upkeep and a gradually improved form of construction.

Plenty of Work to Do

"The magnitude of the task is at times appalling, but it is a positive fact that from semi-chaotic conditions a definite method of procedure is being evolved. Of course, help of all sorts is being given to the constituent state bodies, which naturally appeal to the national good roads board for advice as to methods of procedure. The A. A. A. national headquarters in New York city have served in great degree as a clearing house for the whole country, and it is worthy of note that four-fifths of this correspondence now has to do with the roads question and the co-related question of touring information.

"An important move which the A. A. A. is considering, and which seems to meet with great approval, is the establishment of additional headquarters at Washington, in order to be in thorough touch with the national legislative situation. The committee appointed on this question will report at the forthcoming annual meeting.

"In the furtherance of state highway development, Good Roads Chairman Diehl has drawn up a model highway law, which is being sent to the governors, and whatever road officials may exist in states where no definite plan of roads improvement has been adopted. This bill is accompanied with the uniform motor law, which has been brought up to date by Legislative Chairman Terry, and the demand for these two pieces of literature is calling for the distribution of several thousand copies in all parts of the country. These measures supply a basic foundation, even the public opinion has not yet been formulated sufficiently to secure their complete acceptance in the form drawn.

"It is almost impossible, within reasonable confines, to give a summary of what has been done, and is in process in this state work. In Maine, for instance, the state association was formed, resulting in an active good roads propaganda. One of the members proposed a plan for capitalizing the car registration fees, and referendum in September brought a four to one favorable vote on a $2,000,000 bond issue. In Idaho, a plan is on foot to secure a similar bond issue on much the same basis. In Montana, the state association is arranging to introduce a model motor law, and a highway bill patterned after the New York law. In Washington, North Carolina, Nevada and Louisiana either arrangements are being made to put through new highway laws where none existed, or an improved and more modern law will be introduced. In New York considerable work was done on the second $50,000,000 appropriation, which

Commercial Car Situation

IN addition to the report of the work of the commercial vehicle committee since the last convention of the association in June, three papers dealing with truck and business vehicle subjects were presented during the course of the Detroit convention. S. D. Waldon, Packard Motor Car Co., considered the relative business in pleasure cars and trucks.

"On every side we hear the prediction that the motor truck business will be the big end of the motor car industry in a few years," said Mr. Waldon. "We get it from newspapers; we get it from bankers, and car manufacturers believe it themselves. Undoubtedly, many car manufacturers, and their agents, too, have begun to look upon the truck as the vehicle which is going to carry the financial load of the pleasure car business.

Truck Business Thriving

"Now, it is well worth while at this time to inquire carefully what justification there is for this prevalent conviction. Is growth in the volume of the truck business not vastly overestimated, and has it not already been more than fully anticipated and discounted by manufacturing preparations?

"A somewhat startling answer to these questions is found by a simple comparison of the present relation of the volume of truck business to passenger car business in the United States and the number of factories engaged in each branch of manufacture.

"Carefully compiled statistics which are very conservative show that 652,000 passenger cars were registered in the various states last year. The same compilation shows that 25,500 commercial vehicles were registered in the same year. On this basis there was one truck to twenty-six pleasure cars.

"The total estimated value of the passenger cars was, in round numbers, $812,000,000 and the total valuation of the trucks was $56,000,000. This makes the proportion of passenger car value to truck value last year approximately 15½ to 1.

"Investigation shows the astonishing fact that there are about an equal number of factories in the country producing passenger cars and commercial cars. The numbers are variously estimated according to the ideas of different enumerators as to what constitutes an active manufacturing concern.

"Probably as good a criterion as any is the number of makers who exhibited their products in each line at last winter's shows at New York and Chicago. There were 111 different manufacturers of pleasure cars in the Garden Palace and Coliseum shows and 101 exhibitors of commercial cars.

"Thus we find that there are nearly as many companies competing for $56,000,000 worth of truck business as there are companies dividing among themselves the bulk of the $812,000,000 worth of passenger car trade. On an average, the truck makers had done a total average business of about $560,000 apiece up to the beginning of this year and the passenger car makers a business of about $7,320,000 apiece.

"State registrations for the first 2 months of 1912 showed 17,126 commercial cars registered as compared with 342,439 passenger cars, or slightly less than 1 to 20.

"There is no desire on my part to belittle the motor truck business, but in giving my personal attention to the work of the commercial vehicle committee of the National association, some of these facts have come home to me with particular force, and it seems that a considerable number of persons have been carried away with enthusiasm over motor truck prospects and embarked in their manufacture without making any study of existing conditions and calculating the prospects of the future.

"The cost of manufacturing and selling trucks is considerably higher proportionately to the volume of business done than the cost of manufacturing and selling passenger cars."

Reports on Committee Work

Mr. Waldon presented reports of the work of the commercial vehicle committee since the June 4 convention of the National association, and of the business transacted at the meeting of this committee on November 6. As a result of its de-

we are pleased to say received a favorable vote and was passed at the last election. In Pennsylvania, through co-operation with the state grange, a good roads bill was drawn up, providing for a $50,000,000 bond issue, and this will come before the next session of the Pennsylvania legislature.

Right Material to Use

"The great problem that confronts us all now is what is the right material for a permanent highway. The government has maintained in Washington a bureau of public roads that has been experimenting for years with every road material known. It is the belief of your committee that until we secure the construction of highways that will be permanent in the character of their roadbed, all roads will be much more expensive to maintain than should be the case. We therefore say frankly that in favoring all highway construction, we hope the time is not far distant when the main arteries at least will be of some permanent construction that will need practically no attention for years after being laid. The government can do more to bring about a universal permanent highway construction throughout the country than any other agency. Hence, another reason for our campaign for national highways and federal aid.

"Summarizing our efforts, let me say that we are endeavoring, through the user, to create highway departments in states that have none; to let the motor car owner pay his just proportion of taxes, these taxes to go into the respective highway funds; to secure national aid and federal supervision of the interstate roads, and to hasten as much as we can highway construction in every county in the United States."

Reported by S. D. Waldon

liberations the association revised the scale of minimum body weight allowances based on stake types, as adopted at the March meeting of the association. The revised schedule representing approximate averages of weight of all types of bodies commonly fitted to chassis of the different capacities follows:

Load Capacity, Pounds	New Body Weight Allowance, Pounds	Former Body Weight Allowance, Pounds
1,000	600	500
1,500	750	....
2,000	900	600
2,500	1,000	....
3,000	1,050	700
4,000	1,200	800
5,000	1,350	900
6,000	1,500	1,000
7,000	1,600	1,100
8,000	1,700	1,200
9,000	1,750	1,300
10,000	1,800	1,400
12,000	1,900	1,600
14,000	2,000	1,800
16,000	2,100	2,000
18,000	2,200	2,200
20,000	2,300	2,400

Demonstration Charges

The scale of demonstration charges for commercial vehicles which was adopted at the June meeting of the National association was lowered. This was done because it was deemed desirable that the charges should bear a close relation to the actual normal cost of operation of the vehicles and that the rate per ton mile of work done should decrease as the capacity of the unit decreases. The new schedule is:

Truck Capacity, Tons	Approximate Average Cost Per Day	New Scale of Demonstration Charges Per Day	Former Scale of Demonstration Charges Per Day
½		$10.00	$10.00
1	$ 8.50	10.00	10.00
1½	9.50	11.50	....
2	10.50	13.00	15.00
2½	11.50	14.00	....
3	12.25	15.00	20.00
3½	13.00	16.00	....
4	14.00	17.00	25.00
4½	15.00	18.00	....
5	15.50	19.00	30.00
6	16.50	20.50	30.00
7	17.25	22.00	35.00
8	17.75	23.00	35.00
9	18.25	24.00	40.00
10	18.50	25.00	40.00

Efforts made to ascertain the extent to which the standard truck warranty recommended by the National association has been adopted by manufacturers have brought forth replies from sixty-four makers. Sixteen members and eighteen non-members have reported their definite adoption of the warranty and their intention to incorporate it in their new catalogs when issued. Nine other member companies and one non-member are in favor of the standard warranty and report that when they are manufacturing commercial cars on a sufficiently large scale to require a truck warranty they will probably adopt this one. Seven non-members favor the warranty and say they will adopt it if a majority of the makers do so. Three members and one non-member report that they have the question under consideration. Opposition was found in only nine cases.

With a view to rendering truck bodies more readily interchangeable between different makes of trucks of the same capacity rating, and to enable the body builder to make up stock bodies that can be mounted on any make of chassis on demand, the committee collected a large amount of data from truck manufacturers and from an analysis of this data recommended two standard frame widths, which were adopted by the association. These frame widths are 36 and 42 inches and frame lengths, also adopted, for distances back of the seat are in multiples of half feet, from 48 inches for the lightest packages delivery car to 216 inches for the largest sizes of trucks. The committee's idea in making frames in multiples of the foot and half-foot lengths is so that the number of frame lengths in common use on trucks of 1, 1½, 2, 3 and 5-ton trucks can be reduced to fifteen sizes to meet all ordinary requirements even with short, medium and long wheel bases in each capacity. These would be made in half foot lengths from 8 feet to 15 feet. However, ten sizes from 9 to 14 feet will take care of all ordinary requirements.

Standard Frame Lengths

These frame lengths can be made up to fit the two widths of frames—36 and 42 inches—and in any of the standard types of bodies desired. If these recommendations are adhered to by a majority of the truck manufacturers, it will make the problem of supplying bodies much simpler for the maker of this part of the completed vehicle.

The standard warranty which has been adopted by the National association for both pleasure cars and commercials has been quite generally used by the members of the organization, but not unanimously. In this connection, S. A. Miles said: "That the standard warranty is sound has been demonstrated by the fact that we have never heard of a case in which a manufacturer or a dealer suffered serious loss through its use."

To urge its unanimous adoption, A. L. Pope, of the Pope Mfg. Co., Hartford, Conn., prepared a paper entitled, "Why All Manufacturers Should Use the Standard Warranty." This was read by L. H. Kittredge, of the Peerless Motor Car Co., Cleveland. Although advocating the use of the warranty, the paper took the stand that the car maker should not refer so much to the warranty which his product carries as to the service which he can give should anything happen to it. He should not expound so loudly that he will give free repairs, but he should so build his machines that there will be no repairs needed, whether free or not.

Traffic Considerations

Ever since the organization of the traffic department of the National association in 1908—4½ years ago—no event in the movement of motor cars has escaped its attention. Through the efforts of this department most satisfactory results have been obtained in assisting manufacturers, and hence, indirectly, dealers and car owners, to move their cars to their destinations.

One of the most important matters considered was that of freight car service and to cope with this during the coming winter the N. A. A. M. has decided to open a branch traffic department in the city of Detroit, which will be opened by J. S. Marvin, who is head of this department of the association work, at the earliest moment. The work of this department from the Detroit office will cover probably from Buffalo east and will consist in following every freight car filled with motor cars from the time it leaves the various factories in this territory until it reaches its destination, when every effort will be made to get it hurriedly unloaded and immediately returned to the factory. By such a follow-up plan it is hoped that all available cars for motor car shipment will be used to the fullest capacity.

It developed in the discussion between the motor car manufacturers and the freight representatives of the various railroads who attended the conference at the request of the manufacturers, that the shortage of cars often was due to carelessness on the part of the car manufacturer as well as neglect on the part of the railroads. It developed that motor car manufacturers not infrequently get freight cars delivered to their factory shipping platforms and hold them 3 or 4 days and perhaps longer before making a shipment. The railroad companies in Detroit by investigation discovered this abuse. Loss of time in this way is equally as disastrous as delays on the part of the railroad company holding the empty cars at the point of delivery after the dealer has taken the vehicles out of them. But the railroad freight representatives announced that their respective roads are doing much to relieve the situation by new cars, some of the companies having recently placed orders for as many as 500 new ones.

Conference with Railroad Men

The railroad representatives who were present at the conference were A. B. Atwater, assistant to the president, Grand Trunk Railway System and general manager of the lines in the United States; E. B. Boyd, assistant vice-president, Missouri Pacific Railroad and the Soo Lines; G. C. Conn, vice-president and traffic manager, Pere Marquette Railroad Co.; J. S. Bartle, assistant traffic manager, Achison, Topeka and Santa Fe Railroad Co.; Nat Duke, assistant traffic manager, Delaware, Lackawanna and Western Railroad Co., and W. C. Rowley, general freight agent, Michigan Central Railroad Co.

In speaking on the subject of traffic as it applies to the National association, Mr. Marvin outlined the workings of the traffic departments of the large industrial concerns as a comparison. He placed the amount of freight earned by the railroads of the country on shipments of motor cars from all factories at not less than $6,000,000 per year, and explained how this expenditure should be supervised.

"The question of service," said Mr. Marvin, "is of vital importance to the industry. When the railroads fail to operate on accustomed schedules or when they are unable to keep pace with the manufacturer of any article within reasonable limits in the supply of freight cars, the situation is about as serious as could be imagined. The conversion of finished goods into cash is interrupted.

"When industries in general find it difficult to secure sufficient freight cars, the situation is rendered all the more difficult for the motor car factories, for when a car shortage occurs, shippers of other articles gain the use to a large extent of the motor car cars.

"Such a car shortage exists in this country today; the railroads are right now taxed to the limits of their resources in handling the exceptionally large crops and a heavy movement of traffic of all kinds. One of these periods exists at this time when the return of freight cars to the home roads is difficult of enforcement, and when it is considered that the observance of this rule is all that the motor car industry has to depend upon for the shipment of its goods, the real aspect of the situation confronting us is apparent. To shippers of other articles which can be loaded in ordinary box cars it does not matter so much if the car which they load is owned by the railroad furnishing it to them; but the motor car shipper hasn't this choice and must in the main depend upon the outlying railroads returning the initial line's motor car cars."

In connection with the consideration of truck matters, an address was delivered by M. L. Pulcher, Federal Motor Truck Co., Detroit, on the subject of the injudicious truck selling methods and their effect.

"The necessity for disposing of the product in order to realize on it and devote the money to payment of accounts," said Mr. Pulcher, "and the continuance of manufacture is the root of numerous evils in the selling end of the business. There are two principal kinds, one originating with the factory and the other with the sales force.

"The executives at the factory probably believe that theirs is the best truck built of its rated capacity and price and they cannot see why the salesman should have any difficulty in selling it; consequently they press the sales force.

"The first result of such factory policies is to realize the object—quick sales. If there were no other and adverse results such would become common practice, but the fact is, they are going out of favor both with the truck maker and the public.

Selling Methods of Truck Makers

"The selling of trucks is not very different from the selling of other machinery, and it should be done on the same sound basis, that there is such a thing as selling service on a safe and profitable basis, is shown by the fact that some of our reliable factories, through their selling organization, rent trucks by the month or the year at a price which makes a profit for them in this branch of the business.

Mr. Pulcher took up the methods of sales from the salesman's end, discussing the fallacies of price cutting and the various ways of arriving at charges for demonstration. The common fault of knocking the other fellow's product in order to make sales was discouraged.

David Beecroft, editor of Motor Age and the Automobile, discussed a subject of vital interest to motor truck manufacturers, in that he showed the situation with which the commercial vehicle manufacturer must cope and must remedy in order to make his product show up to its best advantage. Mr. Beecroft's subject was "Transportation Delays at City Railroad and Dock Terminals."

The subject of yearly models was brought up for discussion at this convention of the association, the principal speaker on the topic being H. O. Smith, Premier Motor Mfg. Co., Indianapolis, Ind. Mr. Smith's address was entitled "Yearly Models." He took a firm stand against yearly models and attributed many of the present ills of the industry to the annual model. He described the annual series or models as a barnacle that has fastened itself upon the industry. Among the various injuries worked by the annual model is that of factory expense, in that each annual model incorporating changes means the abandoning of jigs, tools and other equipment. There also is a factory loss in production because the workmen in the factory who have grown familiar with the production of the previous model produce at a lower capacity during the time required to familiarize themselves with the new job.

Yearly Models Discussed

"I am not sure that any particular changes made from year to year makes new buyers, an exception, however, being the addition of such an accessory as self-starters," he said. "How many of the 999,000 owners in the United States today purchase their first car because it was one of the latest models?"

One of the ills of the annual model is the early announcement, an example being a concern announcing in April, 1912, its 1913 model. This announcement being made before some of the Iowa dealers had a chance to even demonstrate their 1912 models to the buyers. These announcements merely serve as signals to the buying public to stop buying 1912 models and wait until the full complement of 1913 models have been announced.

Yearly models cause unrest in factories. There always is a hurry, a hurry to complete the last of the old models; a hurry in the tool room to get the jigs and tools ready for the new models; and other hurries. The annual models can be charged with a second-hand car evil which has loaded itself on the industry.

Mr. Smith concluded his paper by establishing the fact that the new annual models or series does not actually create new business.

Following this paper one of the most heated discussions of the entire conference took place. The makers ranged themselves on both sides. Those who talked in favor of the annual model advanced the argument of style as a selling factor; whereas those opposed to the annual model centered their arguments around service rather than style.

On the topic of motor car selling, the manufacturers heard two able papers, one by Hugh Chalmers, Chalmers Motor Co., Detroit, who attacked the selling problem with which the car maker of today is confronted, and the other by E. R. Benson, Studebaker Corporation, Detroit, on territory and discounts.

"Our selling problem," said Mr. Chalmers, "may be roughly divided into two

classes—first, those the solution of which can best be accomplished by the manufacturers as a whole working together; second, those in the solution of which each company must go its own way and find its own best methods. It is the first class, very naturally, that we should consider here.

"We are led to the first problem worth our while to consider by the question, What is selling? What constitutes a sale?

"It seems to me that selling—selling a motor car, for instance—is something more than simply exchanging a motor car for a check or for so much cash. This may be merely a friendly transaction; or an exchange, fair or unfair, or perhaps a bit of charity or philanthropy. Selling, real selling, is the disposal of goods at a profit. Anybody can give goods away, but selling things at a profit is a job for good salesmen and good business men. Let us keep this point in mind.

"Now, gentlemen, business exists for the net. It is a nice enough thing for those who like it to build up a great volume of gross business merely for the sake of talking about it, but the final test of success is in the net figures. The prime object for which we are all working, therefore, is to make money.

"Most of us do business through dealers, and most of us doubtless will continue to do business that way, in large part at least, for a long time to come. The dealer, then, and some of his problems represent our first big problem. It seems to me that car dealers are of more vital importance to both the manufacturer and the buyer than is the dealer in nearly any other line of business. The right sort of car dealer is harder to get than a good dealer in other lines—that is why he is so vital to the manufacturer. And, again, a car dealer is needed more by the buyer after the purchase than is the dealer in any other line—that is the public's vital interest. Both the manufacturer and buyer, therefore, are anxious to have a good dealer and to have him remain so. A good dealer won't remain good very long unless he can make some money; unless his business will show a net profit. Either he will get out of the business, or he will simply drift along for a time, only to fail entirely in the end."

Effects of Over-Production

Mr. Chalmers pointed out how overproduction affects sales, how second-hand cars, weather, good roads and honest advertising have a good or bad influence on the number of cars disposed of.

Inasmuch as the apportionment of territory and the discount to be allowed the agents are much mooted questions, Mr. Benson's talk was very timely.

"Territory in one sense," he said, "is the capital of the sales manager, inasmuch as out of it he has to obtain his results. The subject of territory, therefore, the man's continually the deepest study and research; it demands that we should all have ready the best sources of information and the latest data to draw from; that we should have on hand statistics on population and wealth; late reports on manufacturing and other industries; reports on crops, on mercantile conditions, on the status of the markets of the country, as well as continual reports from our own traveling representatives, analyzing conditions from their points of view.

"Before the manufacturers let contracts for territory they should know all there is to know about them; about their ability as salesmen; their financial status; how they are regarded in the communities in which they live and so on," according to Mr. Benson.

He states that discounts must necessarily be considered in conjunction with territory, as it is also a part of the capital which is handed to the sales manager on which to promote business; consequently, discounts must essentially be viewed from many angles, such as those given to the large distributor who acts more or less as a jobber and controls a large territory; the regular dealer, who does not have such a large territory; and the sub-dealer who has a very small territory.

E. R. Benson on Territory Division

Mr. Benson believes that the discounts and divisions of territory, no matter to which class given, should all be controlled, systematized and agreed to by the manufacturer in order to insure his procuring the most out of the territory. He took up the consideration of the bonus or rebate plan and the system of graduated discounts by which the dealer commences at one rate and gets a greater discount in proportion to the amount of business he does.

To the manufacturing branch of the industry the address by G. W. Bennett, Willys-Overland Co., Toledo, O., on the multiplicity of models belongs. Mr. Bennett advocated the concentration upon a small number of models, since the marked successes of the motor industry will in the future lie in specializing, each plant making that which best fits its demands, and producing that model in the quantities to which its place in the motor market entitles it.

To make several models in a factory which is equipped to make not more than one satisfactorily, necessarily restricts the output of that plant and divides the energies of its engineers, its operative force and its selling force into several small channels, all of them considerably below par in efficiency because of such division.

"The growth of the industry shows," said Mr. Bennett, "that the most prominent manufacturers have realized this and are catering to the class of demand which they can best supply. I believe that this development will become more marked, and that in a very few years each factory will limit its product to one model with perhaps several styles of bodies interchangeable on the chassis.

"It may not always be possible for one manufacturer to profitably restrict himself to one chassis, but it will be possible, if more than one is considered necessary, to make a large number of the parts interchangeable, and only in this event would the production of two models be warranted.

"Furthermore, the subject of subsequent service is involved so much that where more than one model is built; adequate service to the user is difficult and consequently seldom satisfactory, and without that satisfaction, complete success is impossible."

Mr. Bennett pointed out that since the interests of the dealer are identical with those of the manufacturer, concentration of the manufacturer on a single model allows the dealer to focus his attention to this same single type, with his consequent better acquaintance with it and the methods necessary to sell it.

John C. Wetmore, dean of motor writers, went straight to the point in his talk at the N. A. A. M. meeting late Thursday afternoon, using as his subject "Contests as an Aid to the Motor Industry." Mr. Wetmore bore down heavily on the necessity of contests as an aid to the industry and congratulated the N. A. A. M. upon its having taken over the contest side of the industry on the occasion of the demise of the Manufacturers' Contest Association which had previously worked in conjunction with the A. A. A. contest board.

Mr. Wetmore pointed to the fact that practically every one of the successful manufacturers of today gained his first successes through victories on road, track, hill and in a touring contest. He stated it as his opinion that the manufacturers must provide contests to make the news to enable the newspapers of the country to continue the generous treatment now given news of the industry and stated that unless the makers came forward more liberally with entries for contests they would soon find themselves barred practically from the news columns of the country.

Need of Publicity

Mr. Wetmore said that from one end of the country to the other there was a war today against the amount of space given to motoring and he advised that the N. A. A. M. recommend to the A. A. A. the reclassification of great racing events and segregation of great classics for every class of cars, giving it as the opinion of the newspaper men that greater good would be done the industry by having the great events of the year each a star event in one locality instead of grouping many great events as at present.

He advocated the formation of local promoting associations such as New York has formed to promote track races, road races, hill-climbs, touring events, exhibitions, orphans' day outings and so on, these events being promoted by a stock company composed of all dealers, with 50 per cent of the profits to a sinking fund to cover possible future losses.

New Equity Rules for Patent Cases

PATENT litigation, and in fact recourse to the courts of equity on broader lines, has become so extremely expensive through the cumbersome system in effect that litigants without long purses and the ability to wait have been at a real disadvantage. Therefore, the supreme court of the United States has just issued a new set of equity rules that is pronounced by the bar to be the most revolutionary document of the American republic since the emancipation proclamation.

The operation of the new rules will serve to shorten patent litigation fully 50 per cent on the average and will reduce the costs to a mere fraction of what has been usual. Under the new rules, according to William A. Redding, chief patent counsel for the Automobile Board of Trade, the great Selden suit could have been disposed of in 6 months instead of 5 years and that the testimony that filled thirty-six volumes at a minimum cost of $1 a page for publication alone, could have been contained in one volume.

The new rules number eighty-one. Patent procedure under them will be reduced, as briefly outlined below.

Upon the actual filing of the bill of complaint, the clerk shall issue the process of subpoena thereon. There is notice contained in the subpoena that the defendant shall file his answer in court, on or before the expiration of 20 days after service. If service is accomplished and the answer is not filed, the complainant is entitled to a decree pro confesso.

Final decree may be entered at any time after 30 days subsequent to default.

Save where the existing statutes provide for certain technical forms of pleading, all such technical forms are abolished in equity. As to amendments the rules state that the court, at every stage of the proceeding must disregard any error or defect in the proceeding which does not affect the substantial rights of the parties.

Exceptions to bills of complaint for scandal, impertinence or redundance are barred but the court upon its own initiative or upon motion may strike out such extraneous matter upon its own terms.

Lack of equity has always been a standard plea, where entirely aside from the facts and law involved, the party advancing that plea wished to be given more time. The usual procedure was to allow that while the opposite party might have an action at law, the facts showed that the suit should have been brought on the law side rather than in equity.

The supreme court adjusts this difficulty by providing for the peremptory transfer of cases brought in equity that should have been brought in law and orders that only essential changes shall be made in the forms of pleadings and provides that matters ordinarily determinable in law, incident to a suit in equity, shall be determined according to the principles applicable to the case without sending it to the law side of the court.

This might seem to the layman to be an unimportant detail, but the facts of the case are that this rule may prevent delays of as much as a year in a given suit and expenses running into real money.

The form of the bill of complaint is much simplified. The new form will have five sections; the caption, brief statement to give the court jurisdiction; the facts relied upon by the plaintiff, omitting all matters of evidence; exceptions in joinder in the action and a prayer for relief.

Under rule 29, demurrers and pleas are abolished. This means that one of the chief sources of delay in equity is eliminated. All the defenses that are now presented by way of demurrer or plea must be included in the answer instead of being pleaded in succession at intervals of at least 30 days. The effect of the rule will be to make the draughting of bills of complaint much more careful because some technical mistake might lead to the dismissal of the suit by reason of demurrable fault.

United States Supreme Court Frames Regulations to Shorten Legislation

The rule provides for hearing of motions to dismiss on the part of the defendant but specifies that if the motion is not successful, answer must be filed in 5 days on pain of a decree pro confesso.

The issue is joined on the defendant's answer, which must be short, omitting matters of evidence. The answer may state as many defenses as are deemed essential, regardless of consistency. General denials must be avoided. Averments except as to value, if not denied shall be deemed confessed. Matter that heretofore has been used as the basis of cross-bills, must be pleaded in the answer. Unless some counterclaim is set up in the answer, no further pleadings are required. If such counterclaim is alleged, the plaintiff must reply to it within 10 days.

Exceptions for insufficiency of an answer are abolished, thus eliminating another source of delay. Such objections in the future will be handled as part of the suit itself.

The most important change is the substance of rule 46, which reads:

"In all trials in equity the testimony of witnesses shall be taken orally in open court, except as otherwise provided by statute or these rules. The court shall pass upon the admissibility of all evidence offered as in actions at law. When evidence is offered and excluded, and the party against whom the ruling is made excepts thereto at the time, the court shall take and report so much thereof, or make such statement respecting it, as will clearly show the character of the evidence, the form in which it was offered, the objection made, the ruling and the exception. If the appellate court shall be of the opinion that the evidence should have been admitted, it shall not reverse the decree unless it be clearly of the opinion that material prejudice will result from an affirmance, in which event it shall direct such further steps as justice may require."

Where depositions are allowed in exceptional cases or ordered by statute in patent cases, those of the plaintiff must be filed in 40 days; those of the defense in 20 days more and rebutting depositions within 15 days thereafter. Cross examinations are ordered to be held in open court where the opposite party desires such a right.

When the time for taking depositions has expired, the case goes on the calendar automatically. Postponement of the hearing may be had on application of counsel, but the adjournment of the hearing may not go beyond the end of the trial term.

Save in matters of accounting, reference to masters in chancery shall be the exception and not the rule.

The form of decrees is much shortened and simplified, the supreme court ruling that the pleadings, reports of masters and other prior proceedings shall not be recited.

On appeal to the United States circuit court of appeals, the rules require brevity and relevance on pain of having the costs of irrelevant and redundant matter taxed against the party at fault in order to discourage such practice. The rule places the attorneys within its scope and the court is ordered to issue rules against offending members of the bar even when their clients are not held to be amenable.

The old rules of equity are abrogated and the new set effective as of February 1, 1913.

The rule as to the taking of testimony in open court; the omission of printing voluminous records and the simplification of appeal procedure will undoubtedly save millions of dollars a year to litigants.

Under the new rules, the owner of a patent, enters suit against an alleged infringer. He files his bill; subpoena issues and service is had. This may occupy a day or a week, rarely the latter. When 20 days has expired, the defendant must answer and the suit will be at issue. In patent cases the plaintiff has 40 days to file depositions; the defendant 20 days to answer with another contingent delay of 15 days where rebutting depositions are required. The case is then ready for trial and may be heard within 30 days after the time for filing depositions has expired. The operation of the new rules would seem to limit a patent action wherein there are no unusual features to 125 days from the time of filing until the trial. In many instances it would appear that cases might be finally heard in 50 days and that 6 months would be about the maximum limit unless something exceptional developed.

Under the present rules, the answer may be reached in 80 days after the filing of suit, but it may be delayed almost indefinitely by the interposition of dilatory pleas, demurrers and other pleadings upon which issue of the merits of the case can not be joined. The taking of testimony may occupy almost any reasonable amount of time and the rebuttal testimony may still further delay the hearing. The witness to be examined gives his testimony before a master who has no discretion as to its admissability. He must transcribe it for the court's use and it becomes a part of the record. As such it is printed at high cost.

The testimony put up to the trial judge is generally an appalling mass. If he is to do his full duty he is obliged to wade through reams of inconsequential stuff. When he has heard the arguments, he must take the briefs of opposing counsel and the testimony of both sides and mull them over until the equity involved becomes clear to his mind.

For that reason alone many cases are reversed in the upper court. There are so many irrevelant documents imposed upon the court and such a terrific mass of conflicting data is developed at the ordinary trial of even the simplest patent litigation that the chance of disordered proportion is always present.

It is almost axiomatic that skillful counsel can delay action in a patent case almost indefinitely, but such will not be the case under the new rules. The limits are clearly defined and in future it will be a remarkable patent case indeed that will linger in the courts pending a hearing for so much as 1 year.

Of course, the new equity rules will not affect the operation of the patent office. That must be done by federal statute. The Oldfield revision of the patent laws died an unmourned death when the late session of congress adjourned. The measure may be revived next fall but those nearest to the project are least optimistic.

GRABOWSKY AFFAIRS

Detroit, Mich., Nov. 19—Despite any statements to the contrary, the Grabowsky Power Wagon Co. has not yet been adjudicated a bankrupt, although a petition recently filed by several of the creditors of the concern in the federal court in Detroit probably will result in such action. Judge Tuttle appointed the Federal Truck Co. receiver, but until the plant has been inventoried and appraised, it will be impossible for the court to act.

It is the intention of the receiver to conduct the business temporarily and in the event the court orders a sale it is hoped that it can be made with the business as a growing one. This order should be given the latter part of this week. Several concerns have shown an interest in the matter and are preparing to make a bid on the business.

Rumor has it that the Alco people have an eye on the proposition and in other quarters it is stated that the General Motors Co. is also looking it over. It is impossible to verify these reports.

GERMANS BUY OUT HENRY HESS

Philadelphia, Pa., Nov. 19—Henry Hess has resigned as president of the Hess-Bright Mfg. Co., his interests in the big ball-bearing concern having been purchased by the Deutsche Waffen-und Munitions Fabriken, or the DWF as it is more familiarly known. The new German owners held a meeting this afternoon, after which it was announced there will be no change of policy. M. Bright will be the new president, while A. T. Brugel becomes secretary and C. L. McCalla treasurer.

Many Seeking a National Bill of Lading

CHICAGO, Nov. 13—Energetic action on the national bill of lading measure now pending in congress is promised in local business circles as a result of the interest aroused in favor of it at the weekly meeting today of the Chicago Association of Commerce. This association is largely the mouthpiece of Chicago commercial interests and the motor car industry is well represented in it.

The national bill of lading measure is what is known as the Pomerene bill and was passed by the senate during the last session of congress. It has not been reported out of committee to the house but is expected to come up for consideration by the house during the next session. The measure is designed to correct the present confusion in regard to the actual status of bills of lading as security for drafts on the shipments which they represent.

Inasmuch as bills of lading are employed extensively by motor car makers and their agents as collateral for borrowing money before the shipments of cars are delivered, it is of considerable moment to them that the status of such instruments be clearly defined. The evils of the present situation as regards bills of lading were brought out forcibly by Clay H. Hollister, chairman committee on bills of lading, American Bankers' Association, who spoke on the "Present Status of the Bill of Lading Situation" in congress, and John F. Hagey of the First National Bank of Chicago, whose topic was "Bills of Lading as Collateral."

It developed from the talks of these two speakers that great confusion exists as to the exact legal status of the bill of lading as negotiable paper. The chief difficulty seems to be that in most states the railroad cannot be held responsible for the delivery of the complete bill of goods specified in its bill of lading, the only case in which an agent is not responsible for the goods handled by it. When the bill of lading is accepted as collateral security for a loan or transferred in any other way as negotiable paper, payment on it will be refused if the entire shipment specified has not been received. Naturally, the transporting agent, usually a railroad, would be expected to be responsible for the difference, but though in ten states there are laws to that effect and the courts of others have so ruled the United States supreme court holds that the railroad cannot be held responsible for the error of an agent in making out the bill. Consequently the loss falls on the innocent third party, usually a bank. Similar difficulties are encountered when duplicate bills of lading are issued or complete bills on incomplete shipments.

This confusion has caused the banks to become very chary about lending money

Chicago Association of Commerce Takes Action in the Matter

on these instruments, where such loans are made, the banks basing their reliance more on their knowledge of the integrety of the borrower than on the validity of the instrument. The purpose of the proposed legislation is to make the bill of lading nationally worth as collateral, the amount specified on its face. It is expected that great pressure will be brought to bear on the next congress to get the measure made a law as early in the session as possible.

OHIO DENIES BANKRUPTCY

Cincinnati, O., Nov. 19—The Ohio Motor Car Co., against which the Eisenman Magneto Co. and other creditors brought proceedings in involuntary bankruptcy, a few weeks ago, has filed its answer denying that it is insolvent or that it has committed any act of bankruptcy as charged. A demand is made for a hearing before a jury. President C. F. Pratt, upon the authority of the board of directors, made the answer. Great efforts are being made to reinforce the Carthage plant. It is thought that the bankruptcy matter will be cleaned up the same as it was 2 years ago. According to a rumor, West Virginia capitalists have offered $600,000 for the plant.

WARREN CREDITORS MEET

Detroit, Mich., Nov. 20—Special telegram—At the request of the directors of the Warren Motor Car Co. creditors and officers of the company held a joint conference at the Pontchartrain hotel yesterday, at which it was decided to extend all notes and other obligations until about June 1. Creditors were unanimous in their opinion that the Warren company is in healthy enough condition to continue business. On November 12 another joint meeting was held at which the exact condition of the company's affairs was gone over. The liquid assets are about $375,000 under the new arrangements, while liabilities total $350,000, of which $50,000 is a stationary liability against the plant, leaving sufficient margin for conducting the business.

Although the plant has not been operated at its full capacity of late it is expected that within 2 weeks it will be turning out its maximum output again. Cars to take care of 2 months' business are ready for shipment at once, while the entire 1913 output of 1,500 machines has been sold, which will take care of the business up to July 1 of next year. The various models will be continued as planned.

At its meeting six were added to the directorate from among the creditors. The enlarged board is made up as follows: Harry Bassett, Weston-Mott Co.; H. J. Mallory, Weston-Mott Co.; F. H. Lewis, Lewis Spring and Axle Co.; M. R. Jencks, Port Huron Engine Co.; J. W. Mowe, Firestone Tire and Rubber Co.; G. Jahn, Bosch Magneto Co.; Homer Warren, C. R. Wilson and C. H. Wilson. The three last named are of the old board.

On Thursday afternoon, November 21, a meeting of the directors will be held, at which the resignation of several of the present officers will be accepted and new ones elected.

KING COMPANY'S PLANS

Detroit, Mich., Nov. 16—Following the visit of Artemus Ward to this city to look over his recently acquired property, the King Motor Car Co. which he purchased for $40,000, it is announced that the reorganized concern will be a close corporation, all of its stock to be held by Mr. Ward and those actively engaged with him in the enterprise.

Artemus Ward, Jr., only son of the new owner of the King interests will spend much of his time here in the interests of his father. The former is to be president of the company. The personnel of the concern in addition to Mr. Ward is: J. G. Bayerline, manager; T. A. Bollinger, factory manager; T. P. Chase, engineer; J. B. Siegfried, purchasing agent; W. L. Daly, sales manager; J. Mohardt, superintendent; F. A. Vollbrecht, chief accountant and George Gurney, manager service department.

The present line of four-cylinder cars will be continued, in addition to which another model will soon be placed on the market. This latter machine is really the one which Mr. Bayerline, who was formerly connected with the Warren Motor Car Co., built last summer. It was designed by Mr. Chase under direction of Mr. Bayerline.

ATLANTA HAS BIG SHOW

Atlanta, Ga., Nov. 16—The Atlanta show was opened tonight. There were thirty-two branches and agencies exhibiting cars and accessories. The exhibit was divided as follows: Gasoline pleasure cars, seventy-eight; electrics, seven; commercial cars, six; polished chassis, four; accessory exhibits, eight; oil exhibits, one, and motor cycles, five.

Judged by the standard of southern exhibits, it was rather the most notable the south has ever known, barring the one ill-starred national show. For one thing stage, by tearing out the wings of the considerably more space was available than last year, 30,000 square feet as against 19,080 in which 1912 cars were shown. This increase of space in the local Auditorium-Armory was accomplished by raising the floor to the level of the stage and by utilizing to the fullest extent the space under the seat banks.

Routes and

1,000 Miles in Colorado

By John P. Dods

Part Two

ON the morning of October 9th we started on our third day's run to Glenwood Springs. We left the hotel about 8 o'clock and found the roads frozen hard although the early morning sun was commencing to make them a little slippery on top. South of Leadville we had found the roads hard and of a gravelly nature, but north to Tennessee pass there was some mud, which was accentuated by some recent so-called fixing of the road which, as usual, piled the softer dirt up into the middle. This short stretch by next summer will be well worked down and placed in good shape, as promised by the Leadville people.

On Tennessee Pass

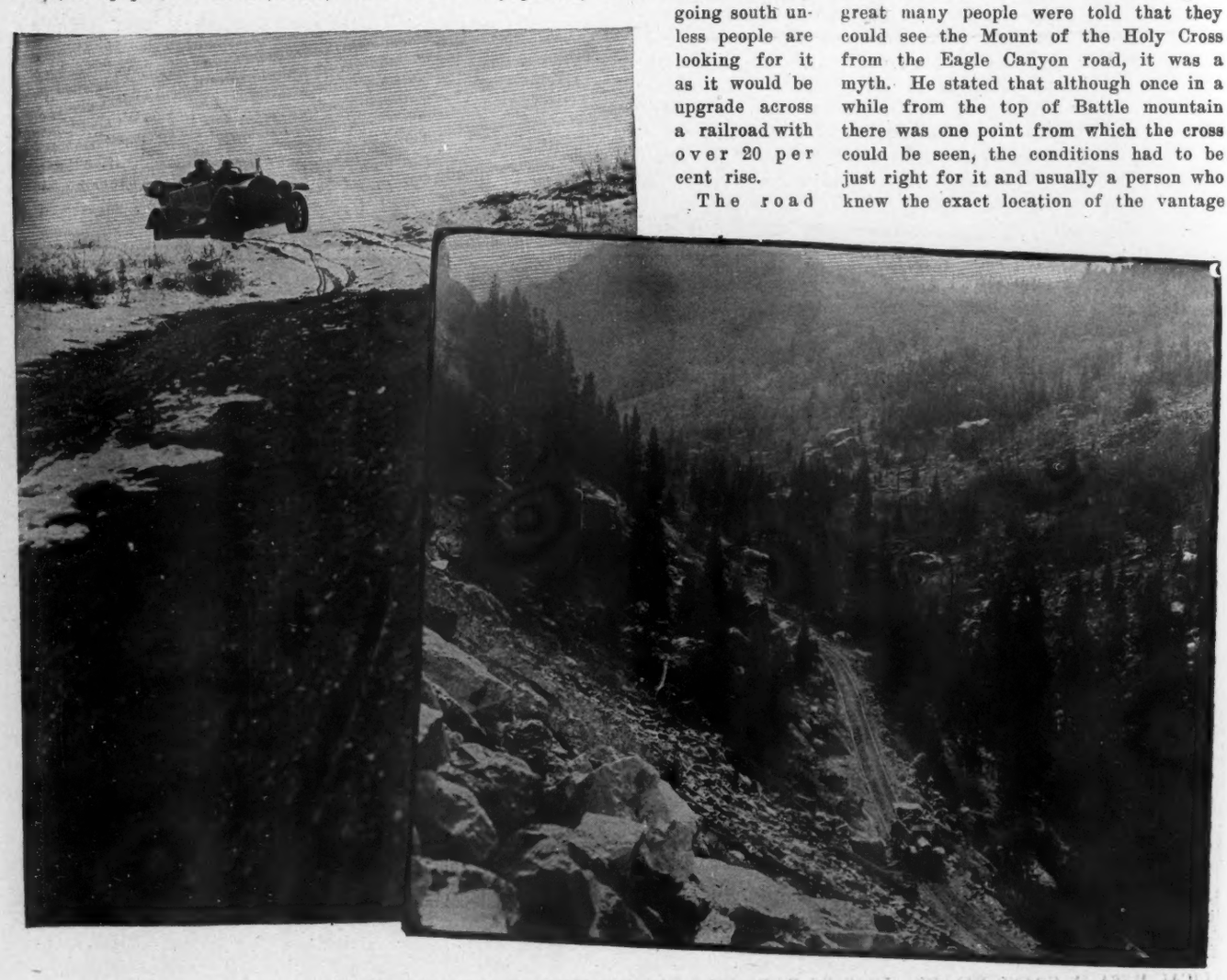
We hardly noticed the climb to the top of Tennessee pass, as there is only one short, steep pitch at mileage 50.5, with a maximum grade of about 16 per cent. Although this is the crossing of the continental divide, the altitude at the top of the pass is only 10,276 feet, less than 100 feet higher than Leadville. There was quite a bit of snow in the pass and no doubt later in the day the road would have been rather slippery.

Coming down off the pass the grade is much more noticeable as it is practically all downgrade for over 4 miles with a drop of about 1,100 feet. The road, however, on the western side of the pass is of a hard, gravelly nature, and although narrow with sharp turns no difficulty should be experienced in making the climb on the southward trip. We were warned beforehand about one very steep pitch just beyond Mitchell at mileage 54.1, and this may possibly cause a little difficulty going south unless people are looking for it as it would be upgrade across a railroad with over 20 per cent rise.

The road gradually works into a small canyon on the west fork of Eagle river. But at the foot of the hill, where the two forks join to make the Eagle river proper, the valley widens out quite perceptibly for some distance. For about 3 miles into Pando we followed a built-up road well graded, which though slightly slippery when we went over it, would be in excellent shape during most months of the year.

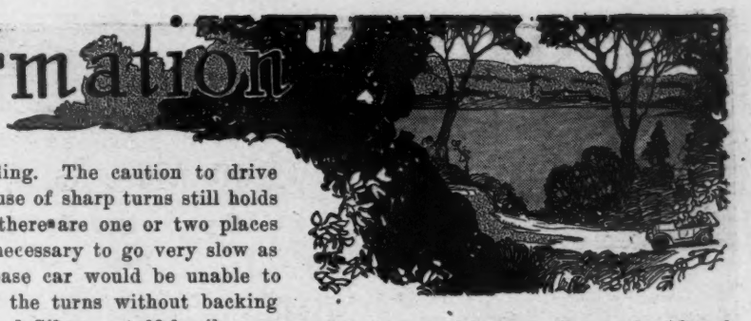
A Common Delusion

Below Pando the hills gradually begin to close in again and road becomes more decidedly downgrade. About 2 miles beyond where Homestake creek joins the river, some people had told us that we could see the Mount of the Holy Cross just at this point, looking up Homestake creek. Although we could see a very prominent snow-capped peak making a very beautiful setting up this side canon, we found out from a rancher that what we thought might be the Mount of the Holy Cross was Homestake peak. The rancher also informed us that although a great many people were told that they could see the Mount of the Holy Cross from the Eagle Canyon road, it was a myth. He stated that although once in a while from the top of Battle mountain there was one point from which the cross could be seen, the conditions had to be just right for it and usually a person who knew the exact location of the vantage



START DOWN THE PACIFIC SLOPE FROM TOP OF TENNESSEE PASS, ALT. 10,265 FEET. EAGLE CANYON ROAD ABOVE RED CLIFF

Touring Information



point on Battle mountain must be along to find it. At about 63 miles the road goes into Eagle canyon proper and we were again on a cliff road 100 feet above the river with the rocks towering above us 1,000 feet. We thought as we came into this that it was the most wonderful thing scenically, that we had come across so far, but a moment later after swinging around a sharp rock and up Turkey creek a short distance into Red Cliff, 62.3 miles from Buena Vista, we turned square left and it seemed to us we were on the top of Battle mountain in about 1 minute, looking down over 1,500 feet at the road we had just traversed in the bottom of the canyon. This is the famous climb to the top of Battle mountain, the name being derived from early Indian conflicts which took place at this point.

On Eyelash Road

The road from Red Cliff all the way to Gilman has been improved and is wide enough at nearly any point to pass. The steepest part is about 17 per cent, although most of it will average during the 1½ mile climb about 12 per cent. The view of the surrounding mountain ranges from the top was the best we had up to this time and turned out to be one of the finest of our whole trip. A ride along this road above the mining camps, which seem literally glued on to the side of the cliff, was at times thrilling. The caution to drive carefully because of sharp turns still holds good, in fact there are one or two places where it was necessary to go very slow as a long wheelbase car would be unable to make some of the turns without backing up. Just beyond Gilman, at 68.0 miles, we began the descent off Battle mountain with one or two stretches about 15 per cent downgrade. After getting down along the river again the valley widens out considerably, although there are no flat places worth mentioning.

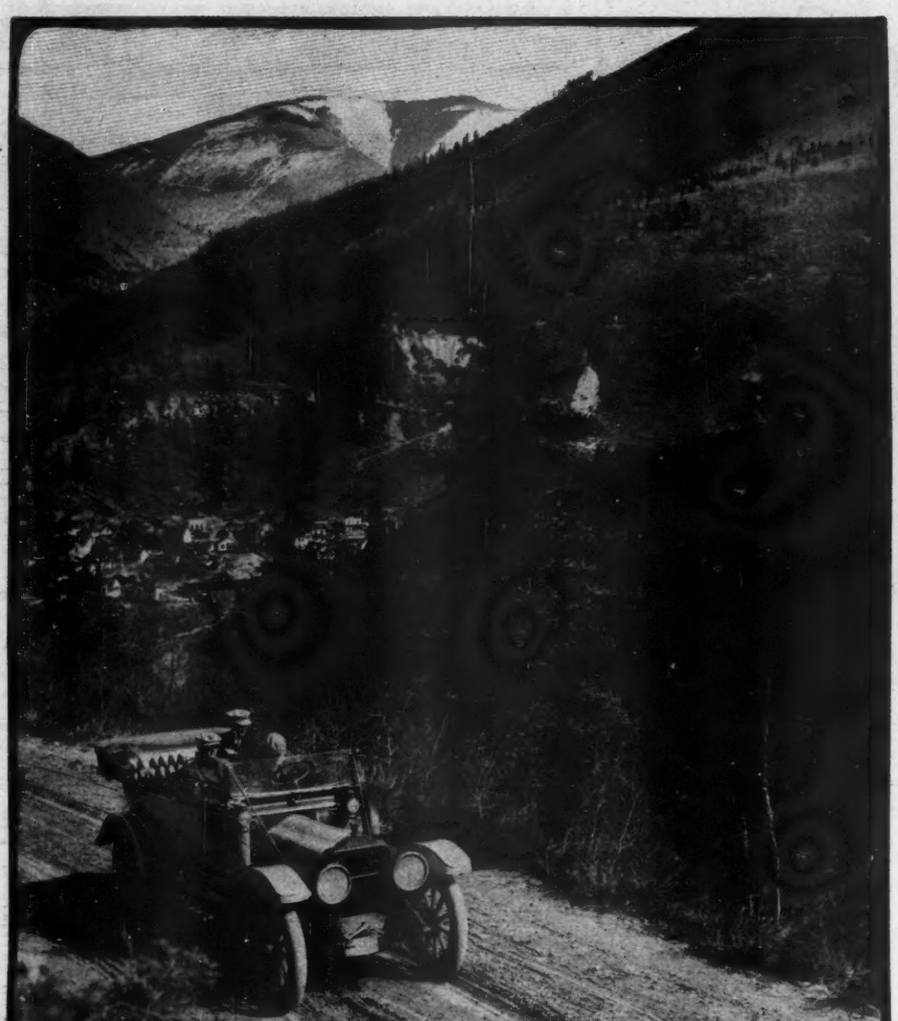
Minturn, 72.9 miles, is a division point on the D. & R. G. Railway. From here on the rock formation is decidedly different than on the eastern slope, the coloring being much more pronounced and formations resembling more the pictures one sees of the mountains in Arizona and New Mexico, with sharp rim rock along the top. From Minturn down, the descent is gradual all the way with no steep grades; the valley widens out more and more and the agricultural operations become more pronounced.

Wolcott was reached 90.0 miles from Buena Vista. The route for Glenwood does not cross the river into the town but continues on the south side of the river for some distance with excellent road conditions all the way. Just past Sherwood Station, 91.9 miles, the valley narrows again somewhat and a few miles farther down the cliffs narrow on both sides to form what appears to be a gigantic gateway as an entrance to the valley. The soil and rock formation at this point are of a bright red and with the sun in the west as it was when we made the trip the effect was very striking.

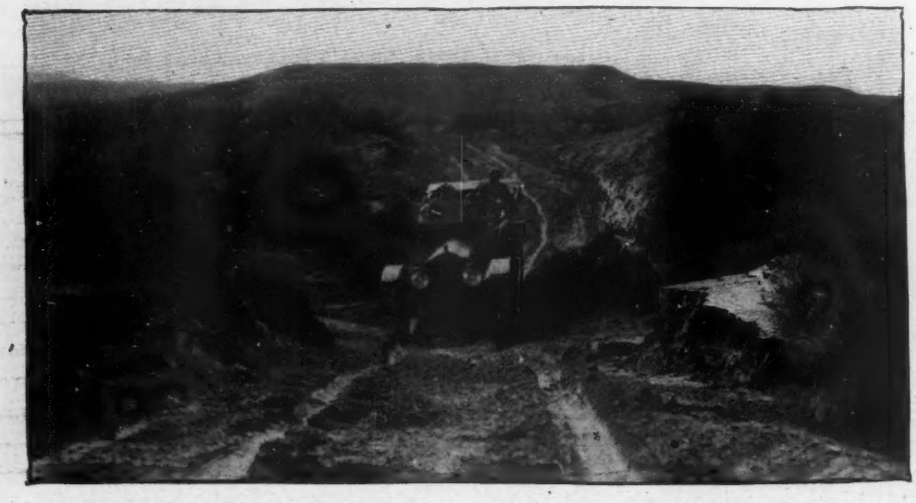
The Canyon of the Grand

Below these two gigantic guardians of the canyon the valley almost immediately widens out into an agricultural country again. Going through Eagle, 100 miles, and Gypsum, 107.6 miles, we crossed the Grand

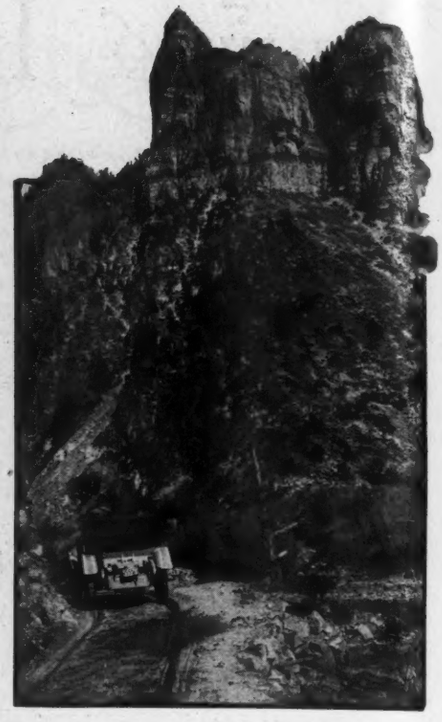
TYPICAL MESA IN GRAND VALLEY. LOOKING BACK INTO EAGLE CANYON FROM BATTLE MOUNTAIN, 1,500 FEET BELOW



HALF-WAY UP THE CLIMB TO TOP OF BATTLE MOUNTAIN. LOOKING BACK OVER RED CLIFF, WITH THE TOWERING SNOW-COVERED PEAKS OF THE ROCKIES IN THE BACKGROUND. A SAMPLE OF SOME OF THE EXCELLENT ROADS ENCOUNTERED



TYPICAL SANDY DRY WASH ON THE DESERT ROAD WEST OF MACK NEAR THE STATE LINE BETWEEN UTAH AND COLORADO. THIS IS ON A SIDE TRIP OUT OF GRAND JUNCTION INTO THE MORMON STATE



PECULIAR ROCK FORMATIONS IN CANYON OF THE GRAND NEAR GLENWOOD

river, and just below this point the Grand is joined by the Eagle and the road enters the Canyon of the Grand. We had realized before leaving Gypsum that we would probably have to drive at least part of the canyon after dark, but were told that it would be easy, in fact one man said that we could drive it at 20 miles an hour. Although this may be possible, and as far as road surface goes it would be, none of us after our experience would be willing to have a seat in a car that made such a trip. The canyon proper began at about mileage 118.0, and from here on almost all the way the road is quite close to the river and averages about 25 to 75 feet above the water. The road is narrow and the rocks rise sheer so close that you can touch them in a great many places from the seat of the car. The railroad on the opposite side and the highway on the north side, in most cases, either have been cut out of the rock or ballasted up along the river to give sufficient room for the width of one conveyance. The river itself is very winding and in addition to this there are many other sharp turns in the road.

A Thriller by Night

To drive such a highway after dark was a real thriller and although we were not able to have our first look at the canyon in daylight, everyone in the party fully appreciated the grandeur of this ride. None of us would care to do it over again, but we would not have missed the experience for a great deal. It is not what can be called a dangerous road in any sense, simply careful driving should be exercised at all times. Just beyond Shoshone Bridge, 123.0 miles, we passed the dam and intake gates for the Central

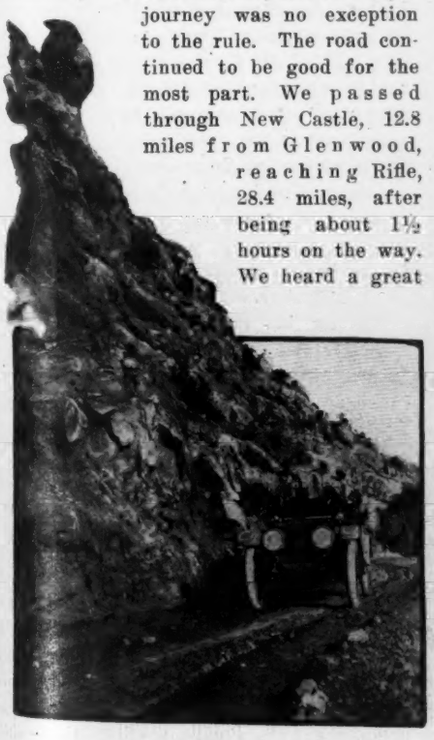
Colorado Power Co. The water at this point is taken in from the dam and carried in a tunnel through the mountain to the wheelhouse which we passed 2½ miles below.

We arrived in Glenwood Springs, 132.5 miles from Buena Vista, at 7 o'clock, and were glad indeed to find that the Hotel Colorado was open, where we were well taken care of the next 2 days. We had planned to go back up the Grand canyon the next morning and get pictures, but we experienced the only rainy day of the trip and therefore were able to enjoy the many advantages of the wonderful swimming pool and cave baths at this resort. On Friday morning the weather was bright and clear again and we went back up the canyon to get pictures and have a look at what we had come through in the dark. We spent so much of the day on this 15 miles of canyon road that it was decided to wait over until the next morning before starting for Grand Junction.

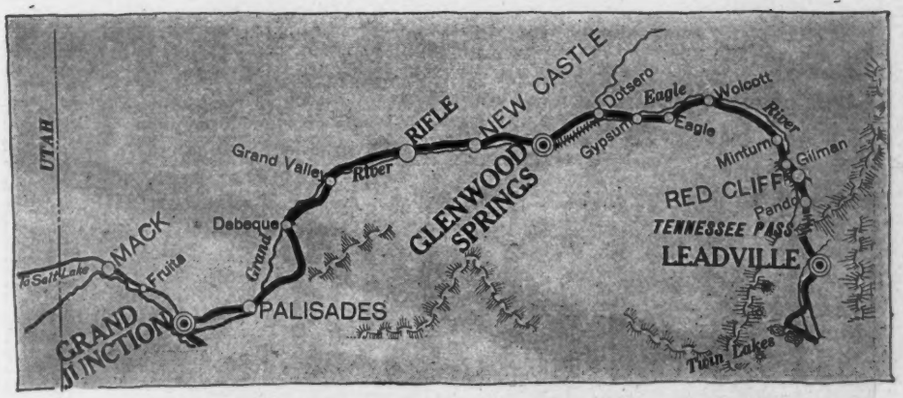
A tourist in this section would do well to spend two or three days at Glenwood Springs in order to enjoy the many side trips which are offered both by motor car and horseback. We were told a great deal about the trip to Red Stone, 28.0 miles; also the one to Hanging lake and many other points of interest, but were unable to spend the time to visit them.

Glenwood Springs to Grand Junction

On Saturday morning, October 12th, we started for Grand Junction, a distance of over 100 miles. Just below Glenwood we went through what is known as South canyon, which is not to be compared in any way with the canyon proper above Glenwood. It is impossible to take a trip anywhere in the state without seeing something of scenic interest, and this day's journey was no exception to the rule. The road continued to be good for the most part. We passed through New Castle, 12.8 miles from Glenwood, reaching Rifle, 28.4 miles, after being about 1½ hours on the way. We heard a great



BALANCED ROCK IN PALISADES



MAP OF ROUTE TRAVERSED FROM LEADVILLE, COLO., TO UTAH LINE

PALISADES ALONG PLATEAU CREEK BELOW DEBEQUE

TOP—A LEAFY SPOT AT GLENWOOD SPRINGS IN FRONT OF HOTEL NEAR THE HOT SPRINGS

MIDDLE—THE CANYON OF THE GRAND NEAR GLENWOOD SPRINGS

BOTTOM—THE PALISADES 25 MILES EAST OF GRAND JUNCTION

deal along the route here about the wonderful hunting and fishing in this section, as both New Castle and Rifle during the season are prominent points for outfitting parties.

The valley of the Grand through here is quite broad with agricultural pursuits being carried on very successfully, although most of the ground has to be irrigated; near Rifle in particular we saw some very fine orchards.

Dobe Mud Roads

From here on the road conditions begin to be poorer with very little improvement except on a few short stretches. Of course conditions as we found them were not quite as good as ordinarily, due to the rain all day Thursday. Local people told us they had had an exceptional amount of rain during the week previous. The soil here is what they call dobe mud, and we found a number of very suspicious looking holes which we did our best to avoid. We followed quite closely the railroad all the way through Grand Valley, 45.0 miles, and just before Una Station, at mileage 49.0, we crossed under the railroad and had our first experience in a bad mud hole. It was not only mud, but so rutty and treacherous that the whole car was twisted so that the hood was torn from the hinges for 1½ inches on both ends. We did not have chains on but by putting in a bunch of dry dirt were able to pull out without a great deal of difficulty. Just beyond this point we turned away from the railroad and crossed the Grand.

We had been told to turn right immediately after crossing this bridge and follow a private road through some ranch property and also to watch out for some mud holes at a certain point. We were looking for these holes but came onto one at an unexpected point we had not been told of, which proved to be at least 18 inches deep in the tracks, with a high center. It was a most innocent looking place, not more than 6 feet across, but when we pulled up on the other side we found our tool box and trunk rack distributed along the road. The center had been so high that it had broken off the heavy body sills which held the tool box as though they were match sticks.

The rancher came down to see us and, although we used some pretty strong language to him, he seemed to be perfectly innocent about the knowledge of this particular hole, telling us that the one farther on was the one people were having trouble in. He further showed us where the new road was to go through before next summer and, although we had a rather sorry experience ourselves, we feel very certain that by next year this particular stretch will be entirely replaced by a new grade. We were able, after about 1 hour's work, to rearrange our baggage and pile everything on in some way, though it was a most uncomfortable ride for the boys in the back seat for the rest of the day into Grand Junction.

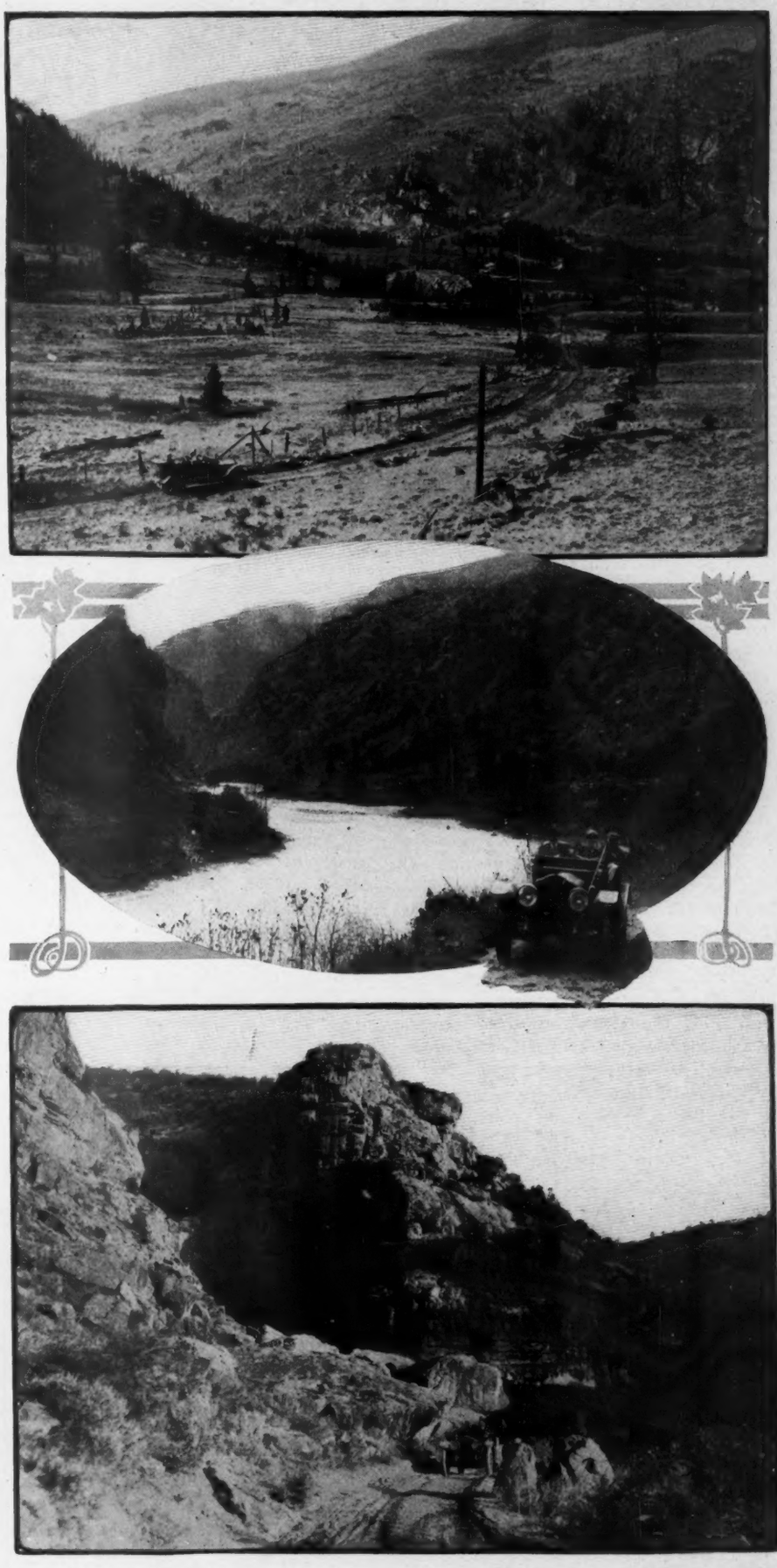
We were now in a mountainous country, the mountains everybody referred to as being mesas; the whole appearance was more than ever like Arizona and New Mexico. Vegetation is very scarce except for sagebrush and other low vegetation. Nevertheless, the trip was very interesting to us all the way down the river. At mileage 59.2 the road turns right into Debeque and continues along the south side of the river for a short distance. It then gradually bears to the southward, leaving the river and going up on top of a mesa with a rather steep, winding grade at 63.0 miles. The road across the top of the mesa was rolling, with some parts rocky and generally rough. This did not last long, however, as we came down off the mesa into Plateau creek 71.1, and from here the remaining distance the road had been improved. Most of the road down Plateau creek through the Palisades had just been completed during the summer by convicts. Although not in the best of shape, due to heavy rains, when we went over it, the road will be dragged.

This ride down Plateau creek between the Palisades was very striking, as the rock colorings were beautiful and some of the formations were the oddest we saw anywhere. At 81.2 the road joins the Grand River valley again and is followed on a new grade, most of the way close to the river, crossing the latter at 86.7 miles direct into the Palisades. We were met here by a car from Grand Junction and piloted through this wonderful orchard section into the city. The roads on this day's run were the worst we had so far been over, but we can truly state that we met no livelier bunch of good roads enthusiasts than those at Grand Junction. The amount of work necessary to put the bad parts in good shape is so small it is practically certain that the Grand Junction people, with the coöperation of other boosters at Debeque and Rifle, will see that the improvements are made by spring. It is not in any way difficult, but in comparison with what we had been over the roads did not show up very well.

Decide on New Return Route

At the dinner given us by the Grand Junction people on Saturday night we learned that although the local people had not only spent a great deal of time and money in improving the route west through Mack, in Colorado, but had also carried their work 40 miles into Utah, the recent exceptionally heavy and long rain had practically destroyed all these improvements. Due to this fact and because we only had about a week or more to spend in the west, we brought up for consideration the advisability of returning over the Rainbow route to Pueblo and thence via Colorado Springs to Denver, thus making a complete round trip which would be of enormous interest as it covered the main scenic attractions in the state over the most improved roads.

(To be continued)



TOP—BETWEEN PANDO AND RED CLIFF LOOKING UP HOMESTAKE CREEK
MIDDLE—ENTERING THE CANYON OF THE GRAND RIVER
BOTTOM—ANOTHER VIEW OF THE WONDERFUL ROCK FORMATIONS OF THE PALISADES ALONG PLATEAU CREEK

The Readers

Why Steam Engine Needs No Gearset—Makers of Parts of Indianapolis Car—Reader Recounts Exciting Experience with Car That Overheated with a Thin Mixture

Flexibility of Engines

Compensation for Loads As Cared for By Steam and Gas Power Installations

LA GRANGE, Mo.—Editor Motor Age—Kindly explain the meaning of a floating axle. Is it correct to say the floating axle carries the housing to the full end of the hub at its outer point? Is the Ford a floating or semi-floating axle?

2—What type of stroke, the long-stroke motor or the square, most nearly resembles the action of the steam locomotive engine in pulling a grade? I notice on a gasoline motor that the motor is running at considerable speed though the car may be going slowly when pulling a grade in low gear, while in a locomotive both the speed of the exhaust and train is slower than that for a motor car.

3—Has it been proved that the long-stroke motor is more saving in fuel and more powerful than the old-style in two cars rated at the same horsepower? I have been told that a certain maker, who formerly made a model with an engine of 4-inch bore and 4¼-inch stroke had to change to the long stroke to keep the same horsepower in that model and enable it to pull hills. Why would this be necessary?—W. C. O'Neal.

1—A floating axle is a live drive-axle in which the driving element is entirely distinct from the load-supporting element; and in which the drive-axle carries none of the weight of the car. A floating axle may or may not have its tube extending through the wheel-hub. The bearings must be outside the axle housing, and are usually in line with the center of the wheel-hub. The Ford axle is semi-floating.

2—The long-stroke motor more nearly resembles the steam locomotive engine than does the short-stroke motor because of the greater pulling power of the long-stroke type at low crankshaft speeds. The reason for the use of the gearset with gasoline engines is that there is a certain speed at which they develop their full power and when they run at any speed below this the power decreases until at very low speeds, say 200 revolutions per minute, in the motor car engine, there is practically no power developed.

So to allow the engine to run fast enough to produce its full power it is allowed to run rapidly but turn the rear axle slowly by means of gears so that it produces a greater turning effort in the axle.

The reason the gasoline engine power depends on its speed is that each time a charge of gas is exploded a certain pressure is produced on the piston, which means a certain power exerted on the crankshaft and the only way to increase the power on the crankshaft is to increase the number of charges exploded in a given time, that is, increase the speed of the motor. When a heavy load comes on the motor, as climbing a hill, the motor slows down and consequently produces less power, making it slow down still more until it stops, unless the gears are shifted so that the motor can run faster. With the steam engine, however, the steam pressure is generated in a boiler. If the boiler is just big enough to supply steam enough at, say 100 pounds pressure for the engine at full speed, the minute the engine slows down under load the pressure in the boiler starts to increase because the steam is not being used up by the engine so fast and cannot get out any other way.

The increase of pressure on the steam engine piston makes up for its slower speed, and it exerts the same power as it did at higher speed. Thus a locomotive can pull a heavy train with the piston barely moving, because the pressure on the piston is enormous.

Another way of putting it is in direct analogy between the two types of power plants. The energy in the coal is made into power in the fire beneath the boiler, and the energy is produced constantly. It is modified into flexible power in the engine cylinder. The gas engine produces its power in the engine cylinder, and at a constant speed. This power is modified into a more or less flexible power in the gearset. This is shown in Fig. 1. The principle that underlies this is that power consists of three factors, pressure, distance, and time, and is expressed in the term foot-pounds per minute. The proportions of these factors may be altered without changing the aggregate power, that is, to lift a great weight a short distance in a given time, or a light weight a great distance in a given time. The steam engine accomplishes this automatically, while the gearset must be operated manually.

3—The long-stroke motor is generally accredited with greater fuel economy than the short-stroke or square engine, all other things being equal, because of the greater expansion of the exploded charge, and because its greater flexibility permits running on high gear a greater portion of the time. It is admitted generally that the long-stroke motor is more flexible than the short-stroke type. In a 4 by 4½-inch motor, to lengthen the stroke without decreasing the bore would actually increase the power, as it would increase the piston displacement, if nothing else. Of course

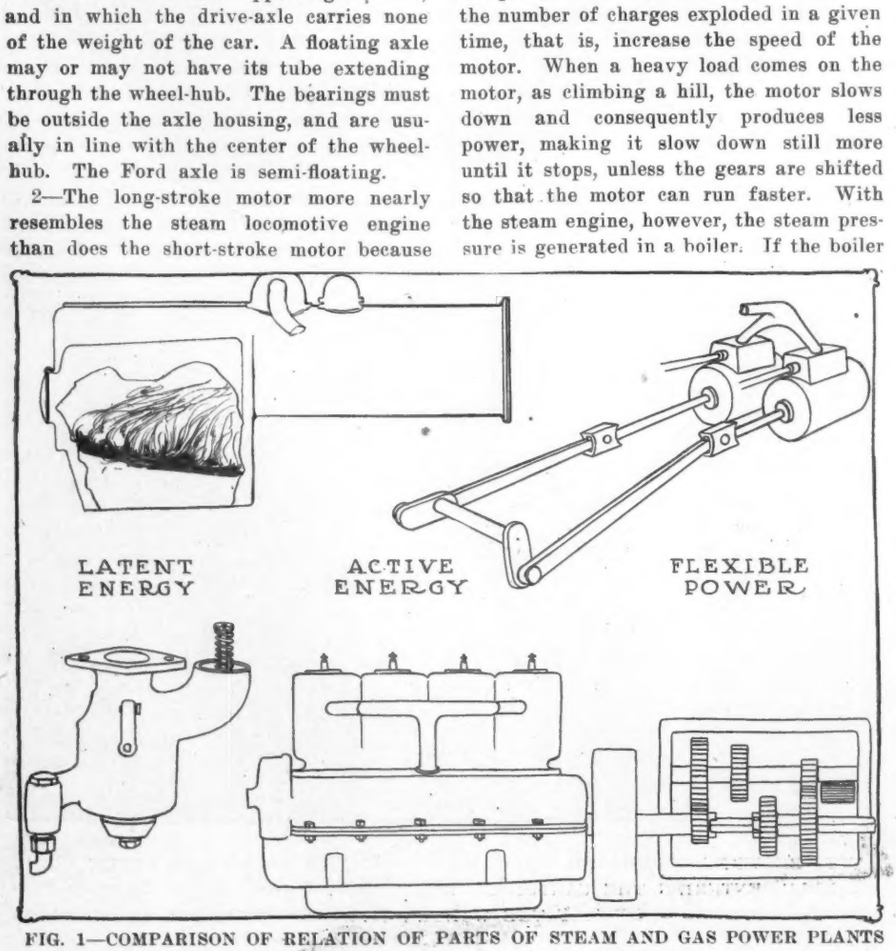


FIG. 1—COMPARISON OF RELATION OF PARTS OF STEAM AND GAS POWER PLANTS

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

Clearing House

Victim of Incompetent Repair Men Appeals for Aid—How to Restore Soft Tools—Price Difference Explained—Battery Wiring and Operation of Voltammeter

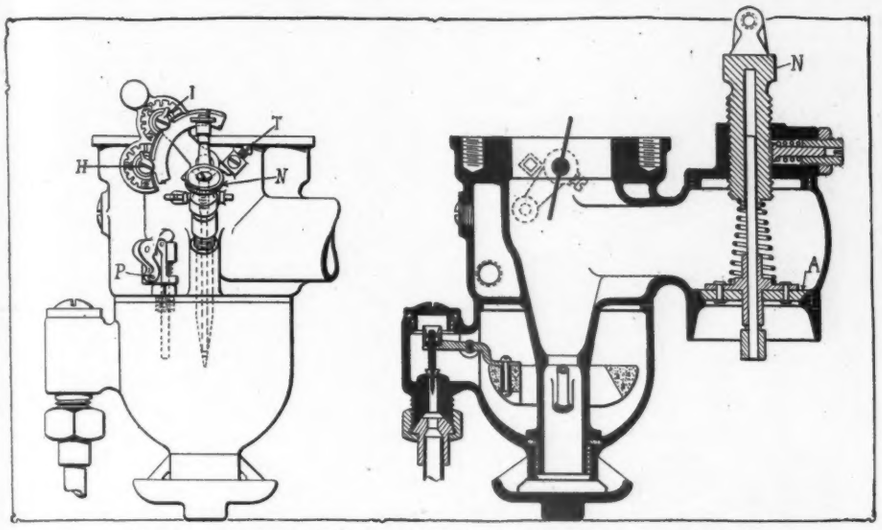


FIG. 2—ADJUSTMENTS ON MODEL L SCHEBLER CARBURETER

a motor of greater power can pull better. But even though the maker kept his displacement the same, as, for instance, with a bore and stroke of 3½ by 5⅞, a displacement of 226.1 cubic inches, as against 226.2 of the 4 by 4½-inch motor, he would probably have the same power, with a good engine design, but owing to the form of his engine, he would have greater pulling power at low speeds.

HARDENING SMALL TOOLS

Chicago—Editor Motor Age—Kindly explain the method of hardening tools. I have several which are too soft.—Reader.

The hardening of tools is a job that requires care and skill, but with a reasonable amount of care, skill is easily obtained if the workman thoroughly understands his work before he goes ahead. The first requisite is a clean fire, and a good draught. Green coal should never be used in hardening; charcoal is to be preferred. A good coke for this use, too, is easily prepared. This is made by banking the fire well with green coking coal, and poking holes in the bank to let the blast through. Turn the blast on full, and when all of the gas is out, the coke may be broken up and laid on the back of the fire ready for use in welding and hardening. The heat should be a bright cherry red, and should be uniform through the parts heated. When this heat is reached, the tool should be held for a few minutes directly over the fire, where it will not chill, until it stops sparking, when it should be quenched immediately.

For small tools raw linseed oil or water may be used. In dipping small tools, they should be immersed endwise, or perpendicularly, for if inserted into the cold fluid at an angle, one side will cool more than the other, and the tool will warp and sustain internal strains. Let the tool remain in the bath until quite cold.

It is usual to temper cold chisels, and other tools that are subjected to great vibration, after hardening, to make them less hard and more tough. This is done by heating them slowly to a medium cherry red, and quenching in cold water. It is the practice of many good smiths to dip small tools slowly, immersing for a few moments and then withdrawing to prevent the boiling of the water. A much better way in which to prevent the drawing of the temper too rapidly, is to heat the water lukewarm, to take the chill out of it. This will be found to make a better blend between the cutting edge and the shank of the tool. In all events, where the tool is only partially immersed, as is the case with chisels and bits, the tool must be kept in motion in the water to prevent uneven cooling and cracking.

EDITOR'S NOTE—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

Carbureter Is Too Small

Buckeye Owner Finds That Efforts of Garage Men to Cure Motor Ills Fail

FREMONT, O.—Editor Motor Age—My Overland model 60 T has been causing me considerable trouble the past few months by a lack of power. Several Overland road mechanics, as well as all of the local repair men, seem to be able to afford me only temporary relief, and that by adjusting the model L Schebler carbureter. Until about a month ago this carbureter was 1¼ inches, when the local garage man could not get an adjustment on it, and so changed it to a 1-inch size of the same model. This gave fairly good results for about a week. Since then it has been necessary to change the adjustment on both air and gasoline nearly every day. The motor has excellent compression, and the Overland road mechanic who adjusted the carbureter last, said that the magneto was in perfect condition. This is the third Schebler L that has been on this car in 10,000 miles, and each has worked the same way for a while. Other Overlands in this city do not appear to lack power under the same conditions.—F. J. W.

Too small a carbureter probably accounts for your loss of power. You have to change your adjustment frequently because the carbureter is inadequate, and cannot supply enough mixture to allow your motor to generate its full power at all speeds. A carbureter properly adjusted should remain so for months.

The first thing to do is to test your inlet manifold for air leaks. This may be done by closing up all openings with paper and paraffin, and immersing it in water. Air bubbles will leak from any hole or porous place in the casting. If this member is found to be air tight, see that the gaskets between it and both the carbureter and the cylinder casting are in good condition. If not, put some in that are. Then test your compression personally, to assure yourself that the valves or piston rings do not leak.

The spark timing may be a contributary cause of your loss of power, as a late spark will not give full power. Test this by turning the motor over until the breaker breaks, at which time the piston of one of the cylinders should be dead on top dead center, as shown by the marks on the flywheel. If the magneto breaks before dead center, the timing is too early. This, however, is not likely to be the case with your car. If your timing is wrong, it is probably late, that is, the magneto will break after dead center. If this is found to be the case, the motor should be retimed by a reliable expert.

The engine being in normal condition in all of these particulars, replace your carbureter. Referring to Fig. 2, the first adjustment to be made is that of auxiliary air-valve A. Turn nut N down until this

valve just seats. Then adjust the needle spray valve screw N, by turning it lightly to the right until it stops. When it meets with resistance, turn it to the left about a turn and a half. Then prime and flush out the instrument by holding up priming lever P for about five seconds. Then start the motor and adjust the throttle-stop T, and the needle adjustment N, until the motor runs smoothly and fires regularly. After getting a good adjustment for low speed, make your intermediate and high-speed adjustments by means of the adjusting dials I and H. Adjust the pointer on dial I from Figure 1 to 2, advance your spark, and open your throttle so that the roller on the track running below the dials is in line with the first dial. If the motor backfires with the throttle in this position, and the spark advanced, turn the indicator a little further toward Figure 3, or if the mixture shows signs of over-richness, turn it toward Figure 1, until the motor runs properly. Now open your throttle wide, and make your adjustment on dial H, for high speed. This is done in the same manner as on dial I. Observe especial caution to avoid getting the mixture too rich.

Next test it at all speeds. This is done by alternately closing and opening the air-valve by hand. If more air improves the running, the adjustment is wrong, giving an over-rich mixture, and vice versa.

MAKERS OF COLE PARTS

Lexington, Ky.—Editor Motor Age—Is the Cole car what is commonly known an assembled car?

2—Is not the motor used in the Cole a regular stock Northway motor sold on the open market, or has it any special points of design outside of brackets and fittings for their starter?

3—Is not the Delco starter and lighting system used on the 1913 Cole identical with the one used on the 1912 Cadillac?

4—Please advise the maker of their clutch and transmission.

5—Do they make their own radiator? If not, who builds it for them?

6—The writer understands they use the small type floating Timken axle and would like to know whether it is furnished them complete by this axle concern, or do they build any part or parts of same?

7—Also, is not the steering gear made by the Gemmer people?—Subscriber.

1—The Cole car is partially manufactured, and partially assembled. It may be termed a semi-assembled car.

2—The motor is a Northway.

3—No. It is similar, but slight changes have been made. These were described in the Cole description in the issue of—

4—The clutch is made by the Northway company. The gearset is made by the Northway company.

5—The Cole radiator is made by the Mayo people.

6—The axles are regular Timken products.

7—Yes.

Says Thin Mixture Heats

Reader Describes Experience with Poor Carbureter Adjustment and Overheating

PLAINVILLE, Conn.—Editor Motor Age—It has been observed that a negative answer was given to the question pertaining to a thin mixture or too much air causing heating. The writer's experience on two occasions leads one to believe that there is more heat derived from a too thin than a too rich mixture.

A matter of 5 years ago, after soldering a leaky gasoline tank, the car ran nicely until the throttle was about half open.

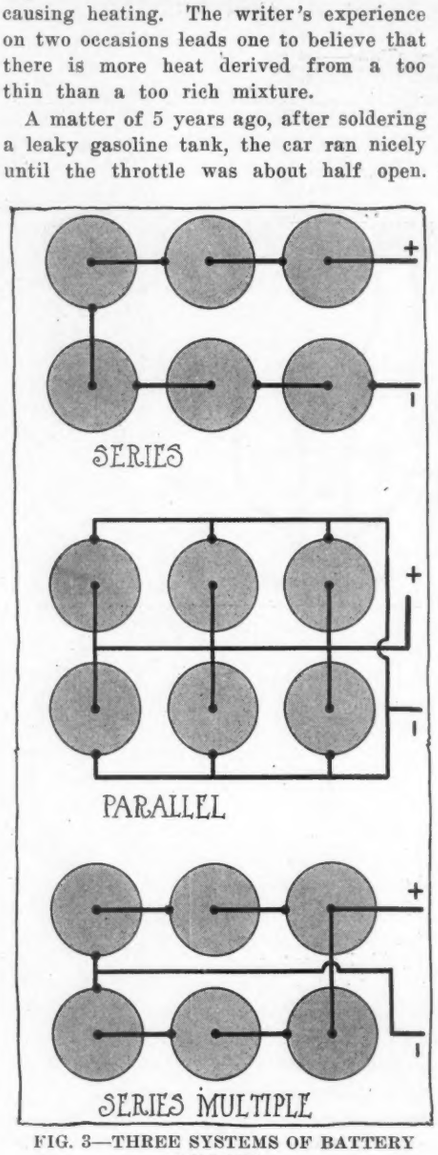


FIG. 3—THREE SYSTEMS OF BATTERY WIRING

Further opening gave speed but no hill-climbing ability, until full opening. when severe boiling would take place on level, and on hills the car would come to a stop. About this time, the odor of hot varnish could be noticed. In a week this symptom took place, the paint on the hood blistered, also the varnish on the frame near exhaust pipe became discolored.

Evidently when soldering the tank, waste found its way inside, eventually lodging against the bushing forming the seat for the needle valve in the carbureter where it swung across the opening when the gasoline flowed rapidly through, giving an exact reproduction of swing check valve shutting off the flow of gasoline and causing heating from too lean a mixture.

On another occasion two bolts tapped into the flange of the carbureter and passing through the flange of the inlet served to hold the carbureter and inlet together. On one of those rare occasions when the motor is wiped up, the motor started up, but to our astonishment would only run with the throttle one-third open; varying the throttle about ¼ inch either way would stop the motor. With the motor as the star actor, a drive of 6 miles was made through the city to a good repair man. The drive made history for me as it necessitated a watchful use of the gear-shift. The constant-speed motor arrived safely but in a veil of steam issuing from the radiator. It was discovered that the aforesaid bolts bottomed in the flange, and the hot water circulation pipe only held the carbureter to the inlet pipe. I evidently put some weight on to the carbureter in cleaning, but yet enough to bend the copper pipe, allowing an opening between inlet flange and carbureter flange, resulting in free passage of air,—a lean mixture, and a hot motor.

The next car owned by the writer heated badly in the early warm days of May and all points that commonly cause heating were checked up—even a larger water pump—different make of carbureter, different plugs, different gasoline all helped but the good effects did not keep pace with the warmer weather coming on. Finally the outer cylinder jacket was drilled in several places and it was found that the core prints had slipped in the process of casting so that the water came and flowed in a direct line right out again, it having no chance to circulate around the cylinder. From the holes so drilled the webs of iron were broken and chipped out, so the water had a chance to do as it was designed to do, after which the holes were threaded for pipe plugs.

This operation made an entirely different acting car. With one car in between, a high grade six-cylinder was purchased and it heated so much that it consumed a gallon of water for 10 to 20 miles of ordinary traveling, depending upon the kind of a day. Streams and troughs were a welcome sight every 20 to 40 miles, but yet the motor pulled fine even when the steam was blowing the hardest, thus giving the rather poor consolation that a gasoline motor is a heat engine.

Having purchased this particular make because of the large water pipes and its reputating for not heating, one's feelings can safely be imagined. After a month's tinkering at the carbureter, etc., it was discovered in this particular low-hung model there was not space left for the air to get out that was drawn in through the radiator, and that the hot air stayed on the inside, raising the temperature. Therefore holes in the underpan made the world look brighter to me, and let the hot air escape from the motor. It boils

no more since I made this change.

Louvers or slits in the side of the hood would have eliminated the heating, and are adopted by several sixes to let out the hot air, but it also lets out the sound that all makers are striving to subdue for their next series.

The writer is much interested in reading the different opinions appearing in Motor Age, and if this first try meets with your approval, will endeavor to do more from time to time.—F. T. Wheeler.

ELECTRICAL EXPLANATIONS

Louisville, Ky.—Editor Motor Age—Kindly explain and illustrate by diagrams the different wirings of a dry-cell battery, that is, series parallel and series multiple.

2—How do these various wiring systems affect both the voltage and amperage, and which is the best to use for new and weak cells?

3—Kindly explain and show by diagram how one indicator of a voltameter can register both volts and amperes.—Ernest Aeschliman.

1—These systems of wiring are shown in Fig. 3.

2—The best system of wiring to use on old and weak cells is series multiple. On new cells, simple series may be used, but just as good results and longer life are obtained by the use of the series multiple system. In general, parallel wiring gives only the voltage of one cell, while the series plan produces the sum of the potential of all cells.

3—This is shown in Fig. 4. V is the positive pole of the volt registering portion of the meter, A the positive pole of the ammeter portion, and N is the neutral or common ground pole. The volt-meter consists of a coil of fine wire about a moving solenoid core, which is attached to the needle, and fitted with a hair-spring resistance. The volt-meter circuit is shunted to step the current down, so that the reading may be taken on the full sweep of the hand for a relatively small number of volts. The winding of the volt-meter is of a great length, and by means of its high resistance allows but a small amount of current to flow through. Wound about this coil, and insulated from it is a coil of few turns of heavy wire, which allows the current to pass through with the minimum of resistance. These coils are therefore magnets, and draw the solenoid core inwards according to the strength of the current. It must be understood that both may register either volts or amperes, and that the only difference between the two instruments is that the relatively small amount of current flowing through the small-diameter, high resistance volt-meter winding measures but a small fraction of the total current, and therefore the drop in voltage is less, and the accuracy is greater. Other forms of these instruments use wound cores and disk, pivoted, or compass-beam armatures, to turn the needle. Calibrations are in red for volts and black for amperes.

Reasons for High Prices

Why Some Cars Cost More Than Others of Seemingly Similar Performance

INDIANAPOLIS, Ind.—Editor Motor Age—I have been asked time and again by prospective buyers what manufacturers put into their cars that should make them so high priced, that is, why one car should cost, say $2,500, more than another.

2—I would like to know what supplies to get to equip and start a good country garage; also what sizes of tires to carry, and wire for ignition and lighting purposes.—Reader.

1—The high-priced car design, while essentially little different from the cheaper car, calls for materials much more costly, machine work more accurate, workmanship more expensive, because done largely by hand, more elaborate equipment, and more expensive body work and upholstery. The cost of these features is high because the demand for cars of the highest grade is restricted, and hence the manufacturers of this class of machine are forced to manufacture in small quantities, which is much more expensive than in the enormous quantities in which small cars are turned out. The buyer of a high-priced car is harder and more expensive to sell and the competition among high-priced dealers is keener in individual sales. This adds enormously to the overhead or selling cost. Again, when a man has invested a small fortune in a car, he expects service, reasonable or unreasonable, fair or unfair, on the grounds that for the amount of money he is spending he is entitled to more car satisfaction. These service systems are very expensive. Advertising, too, is employed to a larger extent by the high-priced makers, in proportion to the number of cars sold.

The makers of cheaper cars, on the other hand, figure closely, they manufacture in enormous quantities, and design their cars to do the work with the minimum number of parts and machined surfaces. They are enabled to get their workmanship exact at little cost by means of special jigs, tools, templates, and automatic machinery, the cost of which is prohibitive to any but those whose output is great. The cars are built with less expensive equipment, and such as is supplied, is purchased in such large quantities that the price is small. The body work is much cheaper. The cars are sold in quantities, and the lowness of their prices automatically makes the market to some extent. Buyers seek the salesmen, instead of the salesmen seeking the buyers. These manufacturers indulge in no extravagant guarantees, and at the price they pay, owners do not expect a great amount of free service. They prefer to pay for it in repair cost, when it is needed, instead of including it in the purchase price. Advertising is not slighted; but the cost of this per car is small.

2—This can only be answered in a general way. In brief, gasoline, oil, repair sundries, a small line of accessories and supplies, and a stock of tools and standard motor-car hardware should be carried. Owners will expect to be able to purchase nearly everything for the car in a public garage, and will usually demand the advertised article. The most popular sizes of tires are 30 by 3½, 34 by 4, and 36 by 4, of which a full supply should be on hand, although a garage-keeper is frequently called on to supply other sizes. In a small garage, tires are likely to move slowly, and as they deteriorate with age, no bigger stock than can be kept moving should be carried. The usual plan with small garages is to watch the needs of the regular customers, and when their tires show signs of wearing out, order new ones of the required size. In some localities, the above sizes would not be called for, so that judgment must be used in the selection of a stock. Wire for ignition should be bought by the reel, and should include high-tension cable, copper primary wire, and twisted lighting wire. One reel of each is enough at a time. There will be no economy in buying a large stock. Local conditions are the best guide to stock selection.

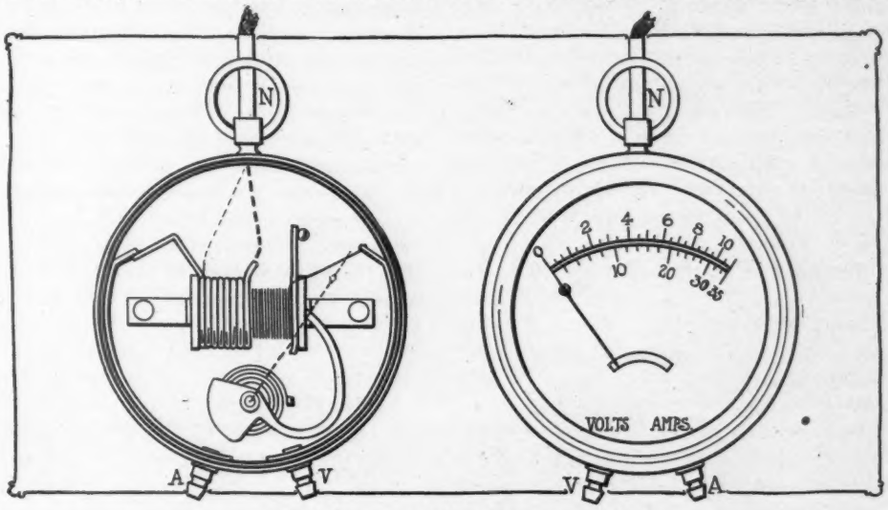
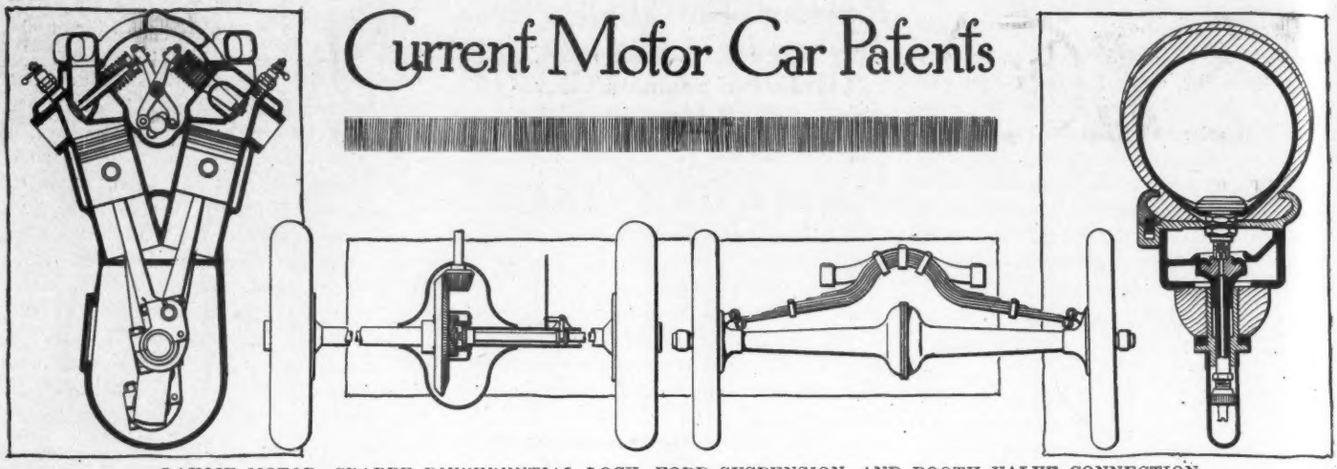


FIG. 4—FEATURES OF VOLT-AMMETER

Current Motor Car Patents

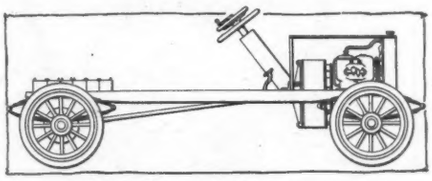


LAVOIE MOTOR, CRABBE DIFFERENTIAL LOCK, FORD SUSPENSION, AND BOOTH VALVE CONNECTION

VALVE-IN-HEAD V-Type Motor—No. 1,044,198—To Alphonse Joseph Lavoie, Outremont, Quebec, Canada. Filed August 21, 1911, dated November 12, 1912. Of the four-cycle type, with valves of the poppet type, this motor is built with two cylinders set on an angle to each other, their heads diverging. Connecting rods from their pistons are pinned jointly to a bearing, in turn secured to the crankshaft. The valves are situated at an angle to the cylinders, their stems extending upwardly and inwardly, and operated by rockerarms from a camshaft carried above and between the cylinders. The spark plugs are carried in the extreme upper end of the valve chamber.

Dynamotor Electric Transmission—No. 1,044,409—To William Morrison, Chicago. Filed February 3, 1908, dated November 12, 1912. Operating on the principle of magnetic drag, the driving means to which this patent pertains consists of a dynamometer comprising a field and armature, one of which is connected to the crankshaft of a gas engine and the other to the propeller-shaft of a motor car, the object being to provide a flexible means of power transmission between the motor and the driving shaft which affords a range of speed differentiation, or gear reduction, to take the place of a clutch and gearset. The action of the device is to cause the driven shaft to be revolved by the driving shaft, in response to the magnetic attraction of the field for the armature, as caused by the magnetic flux across these two members induced by their relative rotation. The greater the speed of the driving member, with a given load on the driven member, the greater is the flux induced, and therefore the greater the magnetism, and consequent tendency of the parts to revolve at the same speed. An additional load on the driven member, however, increases the difference in speed between the two members, with the result of slowing down the driving means. This is prevented by a controller in the field circuit which, when moved in one direction, connects a greater number of cells in a storage battery in parallel with the field circuit, thereby increasing the field resistance and cutting down the magnetic drag, producing low reductions. When moved in the opposite direction the controller reverses this relation, so that the circuit is in series, from the battery to the motor, for the purposes of starting the engine, or with the engine running, of increasing the magnetic drag, producing higher gears. When the magnetic drag equals the driving load, the drive is direct, i. e., the armature and fields revolve at the same speed. The purpose of the battery is to start the motor and excite the dynamo.

Differential Lock—No. 1,043,805—To Elmer W. Crabbe, Bridgeport, Conn., assignor of one-half to Edward W. Harral, Bridgeport, Conn. Filed November 24, 1911, dated November 12, 1912. For the purpose of clutching the divided halves



MORRISON ELECTRIC DRIVE

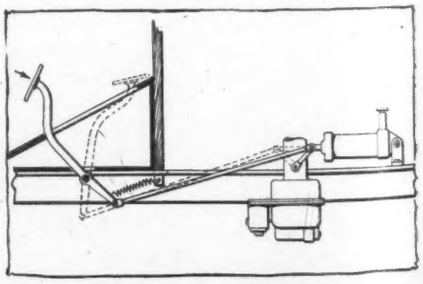
of a live rear axle together, so as to turn at the same speed, independent of the differential, this device comprises a telescopically sliding drive-axle on one-half of the axle, the end of which is fitted with the male member of a clutch adapted to be received by the female member, secured to the opposite stationary drive axle. This sliding axle is controlled by an angle lever, operated from the driver's place by a cable, rod or chain, so that in normal position a spring holds the clutch out of engagement, but when the control is actuated the axle is shifted so as to engage it.

Booth Demountable Rim Valve Connection—No. 1,044,435—To William N. Booth, Cleveland, O. June 2, 1911, dated November 12, 1912. Loosening the valve stem prior to the removal of the rim from the wheel has been found a troublesome feature in the use of demountable rims. The inventor of Booth demountables, therefore, has secured patents on a separable valve stem for use in this connection. It consists of the usual valve secured by a nut to the felloe of the wheel, which, once inserted, need not be removed. The valve tube of the tire is a separate piece, and in removing the tire automatically separates from the felloe valve tube. On replacing the rim on the wheel, the valve tube is automatically depressed, to permit the tire tube to register with it, after which it springs back, securing the two tubes by means of a flexible friction coupling.

Ford Spring Suspension—No. 1,044,038—To Henry Ford, Detroit, Mich. Original application filed July 21, 1909. Divided and this application filed October 13, 1911, dated November 12, 1912. The spring suspension covered by this patent consists of a pair of transverse half-elliptic springs, secured at their ends to shackles near the ends of the axles, and fixed at their middles to arched cross-members of a steel frame above the axles.

Pneumatic Engine Brake—No. 1,044,289—To John D. Taylor, Edgewood Park, Pa. Filed April 25, 1910, dated November 12, 1912. To enable the engine to be used as an efficient air brake, this invention consists of an arrangement whereby the full intake may be cut off and fresh air substituted therefor, and an auxiliary cam brought into play by the shifting of the camshaft to cause the exhaust valve to open at the end of each alternate instroke instead of at its beginning.

Throttle Control—No. 1,043,868—To James J. Quigley, Mamaroneck, N. Y. Filed October 9, 1911, dated November 12, 1912. To render the action of an accelerator throttle control even and positive, this invention consists of a dash-pot secured to the throttle control.



QUIGLEY CONTROL

The Motor Car Repair Shop

Hints On Soldering

SOLDERING is a comparatively easy operation if a few of the small but important details of the art are known; but without this knowledge and the application of these details to the work, a successfully soldered joint is quite impossible. Cleanliness is one of these important details.

In soldering any two parts together, it is most essential that the contact surfaces of the parts be absolutely clean and bright. The hands and tools brought into

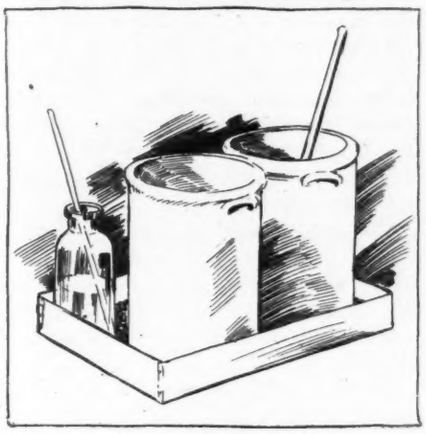


FIG. 1—HANDY SOLDERING OUTFIT

contact with the work must be free from oil or grease, and cleanliness must be rigidly maintained throughout the entire operation. A clean file, scraper, emery cloth or a little uncut acid is generally used in preparing the surfaces, after which they should be warmed, and swabbed with prepared acid; that is, muriatic acid which has been prepared by dissolving in it as much zinc as it has power to dissolve.

The Soldering Flux

The soldering fluid or flux generally used, may be prepared in the following manner: To ¼-pint of muriatic acid add scraps of zinc until the acid ceases to bubble and a small piece, or a few small pieces, of the metal remain. Let this stand for a day, then carefully pour off the clear liquid, or filter it through a piece of blotting paper rolled into a cone or funnel shape with the smaller end closed. Add to this a teaspoonful of sal-ammoniac, and when thoroughly dissolved the solution is ready for use.

The soldering iron, or copper bit, which is constructed of copper because of the qualities of that metal to absorb heat readily and as rapidly give it off again when brought into contact with other metals or substances, should be kept clean and well tinned to facilitate its use in distributing the solder as desired. If allowed to become overheated, crustations will form on the end of the copper bit, which will usually have to be removed with a file before the iron again can be used. A very good addition to a soldering outfit for cleaning irons is a piece of fluorite or fluor spar as it is generally called. This is an excellent flux and after an iron has been cleaned and heated and then rubbed on a piece of fluorite the tin or solder will spread readily thereon and adhere beautifully.

In many motor car repairshops, the acids, etc., used for soldering are kept in any old bottle and in any old place, the result is that they are hard to find when needed, and owing to the lack of a suitable arrangement for holding the receptacles they are often overturned and their contents spilled onto the bench or floor or even on the apron or running board of a car. The disadvantage of this is not only the loss of the acids, but disagreeable stains or damage where the acid was spilt as well. In Fig. 1 is shown the equipment used in a very large and systematic repairshop for holding the acid receptacles. The receptacles comprise two earthenware pots, such as are obtained from the grocer filled with jam or cheese, and one wide-necked bottle which originally contained pickles or preserves. These three receptacles rested in a shallow tray of sheet iron packed with sawdust or fine shavings. The sawdust serves not only to absorb the drippings of acid, but also forms such an excellent bed for the jars that they cannot be easily overturned; and in having them all on a tray in this manner, they are less liable to be scattered and hard to find when wanted in a hurry.

The broad-necked bottle in this equipment, contains pure acid for cleaning parts to be soldered; the first jar contains a dilute cut acid for cleaning the soldering irons; and the other jar holds the cut acid which is used as a flux and applied to the joint just before applying the solder. Wooden sticks are used for applying the acids. The operation of cleaning a soldering iron with acid, consists simply in dipping the hot iron into it for a second.

Making Glass Jars from Bottles

Where the necessary jars for acid receptacles cannot be conveniently obtained, excellent jars for this purpose may be made from old beer bottles and the like by cutting them in half a few inches below the neck as shown in Fig. 2.

The operation of cutting the bottle in half is as follows: Wrap a few strands of cord around the bottle and secure the ends by tucking them in—there should be a knot; then saturate the cord with gasoline or kerosene. Ignite this and let it burn as indicated in Fig. 2, until the flame is extinguished or nearly burnt out; then taking hold of the bottle at the bottom, invert it, and quickly dip it straight down into a pail of cold water. This will cause the bottle to crack or break evenly, and the sharp edges may be ground off with a fine emery stone or perhaps with a smooth file.

Oil Leaks Through Aluminum

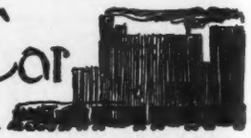
Aluminum is a very porous metal, and owing to this feature of its structure, it is found that pipes and casings made from it are liable to show a disposition to leak which is apt to be quite aggravating to those not familiar with a suitable and effective remedy for such troubles. For instance, at a recent meeting of motor car sales agents there was a general complaint that one of the aluminum water connections of the motor on many cars

FIG. 2—MAKING GLASS JARS

showed a marked tendency to leak. One of the agents then announced he had found an excellent remedy for such trouble in coating the inside surface of such water connections with white lead.

Another firm once found that owing to the porous nature of its aluminum crankcases, considerable trouble was experienced with its motors because of failure of its vacuum oiling system to work properly. To eliminate this trouble, the company now shellacs the inside of its aluminum cases. Similar trouble has been experienced by one of the largest motor omnibus companies in the world, it having been found that there was a tendency on the part of the oil to seep through the pores of the aluminum crankcases, transmission cases, etc., and this concern now has all of its aluminum cases painted with white lead on the inside to remedy the trouble.

The Realm of the Commercial Car



Motors vs. Horses at Freight Terminals

Critical Study of Chicago's Transfer Facilities Shows How Work May Be Speeded Up—Gasoline Trucks Could Triple Capacity of Platforms—Effect of Equine Gait on Drivers of the Old Fashioned Rigs

By William B. Stout

TWENTY-THREE million pounds of freight are hauled from six railway freight terminals of Chicago every day. Three fourths of this is for out shipment, distributed approximately as follows: Illinois Central, 6,000,000; Lake Shore, 4,000,000; Santa Fe, 3,500,000; Wabash, 3,000,000; Michigan Central, 4,000,000. Most of this freight is handled by horse teams, no less than 3,600 teams arriving at these freight platforms daily, as follows: To Illinois Central, 900; to Lake Shore, 600; to Santa Fe, 500; to Wabash, 550; to Michigan Central, 600; to Grand Trunk, 450.

Motor Would Save Two-thirds

As each team makes in contract work three trips a day there are approximately 1,200 teams actually engaged in the railway freight hauling of these roads. At a contract cost of $6 per day, this means that $7,200 is spent every 24 hours for merely the outside expense of the hauling, or $2,160,000 per year.

J. F. Barron freight agent of the Illinois Central, states that from his observation of motor truck and horse work motor vehicles with their better drivers could do the hauling in half the time now consumed, and at one-third the cost. If this be so, the adoption of motor trucks for freight hauling in Chicago would save $1,440,000 per year.

The present cost of moving the freight from the wagons unloading and loading to and from the cars is 42½ cents a ton. The following are average loads:

Illinois Central	5,000 pounds
Lake Shore	4,000
Santa Fe	2,500
Wabash	4,000
Grand Trunk	4,000

At the Illinois Central station 158 men handle all the outgoing freight, using 1,106 hand trucks. At the Santa Fe 40 men handle 2,500,000 pounds each day. The average is around 20 tons per day per man in the best freight terminals.

In the handling of all of this material and the operation of the vast delivery system in connection there has been a surprising inefficiency, and much of this still continues. For a horse team to wait at a freight yard for 1 hour before unloading brings no comment from the drivers. They are used to it and many of them seek for long waits instead of avoiding them. Waits of 3 hours are not infrequent.

At one freight station the street was blocked for over 1 hour, and while the drivers passed the time of day back and forth no one made a start to relieve the congestion. There was no control and when the traffic finally moved on, it was to all appearances, because the drivers got tired and broke the blockade by mutual consent. There were 155 wagons in this blockade for the hour's time, and many for 1½ hours. The delay was due largely to the drivers' laziness, and only partly to street conditions. One officer stationed here regularly could keep the street clear.

Inside the freight depots conditions have been much the same but have been bettered since the culmination of the recent strike so that more efficient systems are in use than formerly. These have been in operation for about 1 month the outside conditions are much the same as before.

Loss of time in all yards is due to the following:

1. Laziness of drivers, encouraged by the pace of the horse and by union influences.
2. Improper traffic facilities, and platform arrangements.
3. Improper internal systems; as follows:—
   (a) Lack of billing facilities in office.
   (b) Scarcity of hand truckmen.
   (c) Scarcity of hand trucks.
   (d) Improper disposal of material already unloaded.
   (e) Conflict between Illinois Tunnel loading and wagon work.

Horse Makes Lazy Drivers

While the greatest item in the congestion is put down as the laziness of the horse driver, yet this is due primarily to the influence on him of the horse pace. Each driver makes 3 trips a day. He could do them in ½ day if the facilities

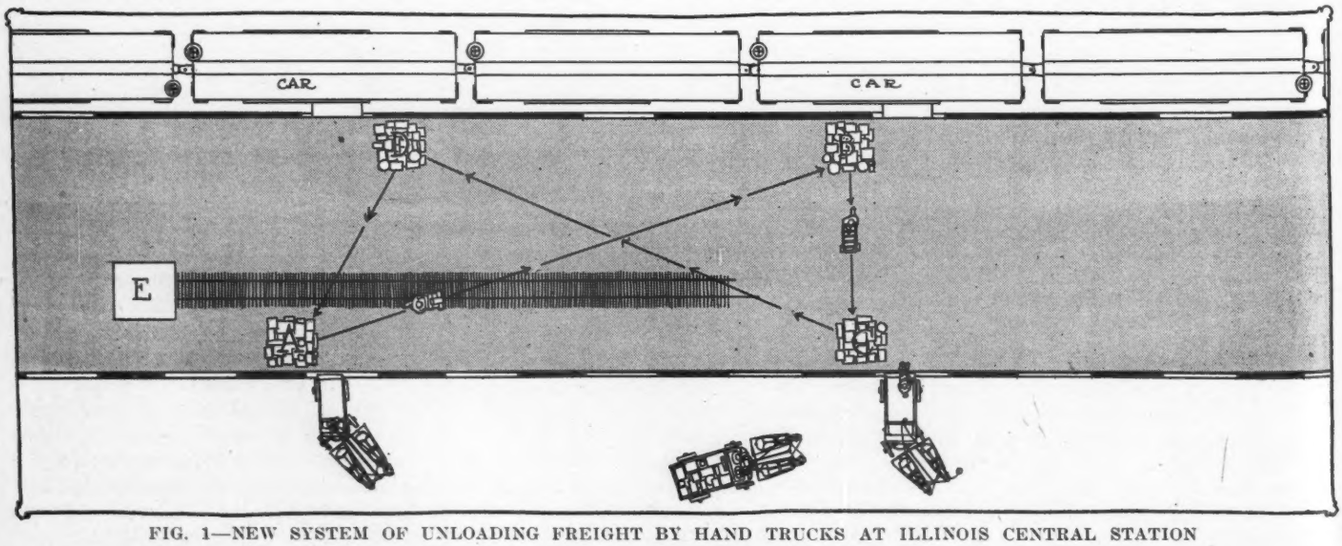


FIG. 1—NEW SYSTEM OF UNLOADING FREIGHT BY HAND TRUCKS AT ILLINOIS CENTRAL STATION

FIG. 2—CONGESTED CONDITIONS AT WABASH AND GRAND TRUNK FREIGHT DEPOTS

were right. If he did he would get but half a day's pay, for his team would have done its maximum daily mileage in that time. To work another 3 loads in the afternoon would require a fresh team. Hence it is to the driver's interest to hinder his horses so that they make but 15 miles in 10-hours their daily limit. Thus he gets a day's pay for what is really a half-day's work—and the union backs him in his inefficiency.

At the Santa Fe station in Chicago, there is a great appearance of business during certain periods of the day, especially around noon and from then to 3 o'clock. A census of the vehicles, however, in the yard and backed up at the platform would show that many of the teams were on the way to other points but had stopped here so that drivers could have a sleep. This yard is a regular stopping place for some drivers who take a nap there almost every day.

How Drivers Soldier

At other platforms wagons drive in for loads to the freight yards and deliberately choose a door at which two or three teams are already waiting. If the driver has delivered two loads in the morning he must take all the afternoon for the third and hence his choice. For from 1 to 3 hours he will loaf on the street or sleep on the wagon, even letting other wagons in ahead on occasions to prolong his wait.

Within an hour of noon if a load is on the way to the yards or a driver on the way back from the yards he will frequently stop at a saloon for an hour or so and let his load stand, blaming the delay, on his return to the freight station.

On Nov. 12 in front of a saloon near the Lake Shore freight yard no less than ten 2-horse trucks without drivers were counted idle at 1:40.

Often freight routes are blocked by drivers to cause further delays. On November 12 the street in front of the Lake Shore in and out freight platforms was completely blocked. On the one side were the projecting vehicles from the in platform, on the right those from the out platform and the space between was just wide enough for two teams to pass. The space between was a lane about 2 blocks long, cobble paved.

Every time a team came out from the in or out platforms or backed in to either all traffic in this central lane was held up. At about 10 a. m. on the day in question the vehicles jammed during one of these periods, the wagons coming in one end meeting others coming from the other direction.

At first the jam was not complete as shown in the first photograph but each driver began to edge forward for every inch he could make. At last the blockade was so thick that the writer had to follow the wall at the side, climbing over the tailboards of loading wagons at the side to get through and make a count. There were 155 wagons in the jam. At 11:30 a driver was met at the center of the space who had started in at the congested end at 10 o'clock. He had been toward the rear of the line at the first blockade but in some unaccountable way had wormed through half way, during the momentary spasmodic movements of traffic which took place from time to time. At last, at about 11:35 the jam resolved itself into two lines, by what appeared to be the mutual consent of the drivers, and traffic proceeded. As it was getting noon drivers were ready to break the jam.

Need of Regulation

This points also to the second reason in the list. The facilities for handling traffic just explained, are far from ideal, for teams backing into or coming out from the platforms on either side hinder central traffic. One officer in the central lane could have directed traffic and have prevented the extended blockade.

In this yard, the congestion was much greater at the north end. This had a direct bearing on the loading times of vehicles as shown in the table of actual times of loading and delay at three separate doors, the one at the south end 75, 68, 7 doors further north, and 58, ten doors beyond.

TIME REQUIRED FOR LOADING AND UNLOADING AND WAITS AT LAKE SHORE FREIGHT STATION

Size	Arr.	Start Unload	Wait Min.	All Off	Unload Time	Left	Total Time	Nature of Load
				DOOR 75.				
2 h	8:45	9:15	30	9:18	3	9:19	34	3 boxes
1 h	8:46	9:20	34	9:25	5	9:26	40	packages
1 h	8:50	9:28	38	9:31	3	9:32	42	6 paper rolls
2-h	9:20	9:34	4	9:46	10	9:47	27	Boxes
2 h	9:45	9:48	3	10:40	52	10:42	57	Full load
1-h	10:10	10:44	34	11:06	22	11:07	57	3-4-load
2 h	10:25	11:09	44	11:28	19	11:30	65	Lumber
2-h	10:40	11:32	Still unloading at Noon.					
					Average, 46			
				DOOR 68				
2-h	8:20	8:21	1	8:33	12	8:35	15	Bbls.
2-h	8:30	9:01	31	9:35	34	9:36	66	Rolls
2-h	8:45	9:37	52	9:53	16	9:55	70	Boxes
2-h	9:20	9:56	36	9:58	2	9:59	39	3 boxes
2-h	9:35	10:00	25	10:31	31	10:33	58	Full load
2-h	10:01	10:35	34	11:10	35	11:12	71	½ load off
2-h	10:15	11:14	59	11:56	42	11:58	103	Full load
					Average, 60			

Size	Arr.	Start Unload	Wait Min.	All Off	Unload Time	Left	Total Time	Nature of Load
1-h	10:30	Standing at Noon.						
2-h	10:34	Standing at Noon.						
				DOOR 58				
2-h	8:45	9:20	35	9:30	10	9:35	50	8 long boxes
2-h	9:00	9:40	40	10:00	20	10:01	61	Full load
2-h	9:28	10:03	35	10:35	32	10:36	68	Full load
2-h	10:20	10:30	17	11:50	73	11:51	91	Full load
					Average, 68			
1-h	10:36	Standing at Noon.						
2 h	10:48	Standing at Noon.						
					Total Average wait, 58 minutes			
				SPECIAL CASES				
2-h	8:50	9:45	50	10:20	35	11:10	2 hrs. 20 min. driver loafed after unloading	

Commonwealth Edison 1-ton electric arrives 11:05. Street blocked. Driver stops at end and carries box ½ block. Saves entering congested area. Entire street blocked for over 1 hour; 158 vehicles involved.

The south door, 75, shows an average delay of 46 minutes per load, the central one, 68, of just 60 minutes, while the third one, 58, at about the center of the street and where the blockade began at this end, of 68 minutes per load.

The extra delay was partly due to the office system, and explains the greater congestion at the north end. In-freight truckmen must get their slips at a window in the office at the north end of the building. At the time this was visited there were about 24 men waiting their turn at the two windows that were open, while their trucks stood idle outside.

Scarcity of Unloaders

Other delays were entirely inside of the freight station and had a direct bearing upon the long waits outside. One of the first difficulties was the scarcity of men unloading inside the freight houses, coupled with the general scarcity of hand trucks for them to do their work with. This condition was observed in nearly every freight station visited. In practically every case but one man was used to a wagon in unloading and, by a peculiar ruling, truck drivers were forbidden entering the warehouses but merely delivered the goods off the tailgate.

In unloading, the goods taken off the wagon merely were staked at the door by the driver. The truckmen inside took the boxes or packages from this pile and wheeled them on the hand truck to the car for which they were numbered. Various systems are used for this work in different freight houses, as will be explained later. In a number of cases it was noted that wagons were only partially unloaded, and the man who was supposed to wheel away material as it was unloaded was standing idle waiting until he could get possession of a hand truck. The driver could not proceed with his unloading until the pile of goods was taken away from the door and the truck man could not take the pile away until he could get hold of a truck. Thus the lack of a small hand-truck held up the whole system.

A condition peculiar to Chicago exists in the freight houses of the Windy City, as each terminal is served by cars from the Illinois Tunnel track. This tunnel undermines all of downtown Chicago, connecting the freight terminals with all of the large downtown buildings so that a large amount of the freight coming in by railroad is shipped direct to the consumer and into his sub-basement by the diminutive cars of the tunnel railway. There are certain days and certain times when the shipments over this tunnel railway interfere with the regular wagon traffic.

The following observations at the Illinois Central freight depot give a point to many of the statements made above, each one illustrating some special detail of actual service, or lack of it, at these yards. At about 2 o'clock on the afternoon of November 11th there was every appearance of the transaction of a great amount of business, though as a matter of fact but little was actually being done. A large number of the trucks and wagons were standing idle with no one about to watch them. A nearby saloon furnished a partial solution of the laxity and delay for here were assembled a dozen or so of the teamsters. Lunchtime was over but that seemed to make but little difference, since, as explained before, three trips marked the limit of the day's work.

On the other hand, the motor truck drivers seemed to be full of the idea of getting away as soon as possible. The horse driver knows the limit of his day's work and his day's mileage. The motor

BLOCKADE WHICH LASTED OVER 1 HOUR AT LAKE SHORE DEPOT, INVOLVING 155 VEHICLES

MOTOR TRUCK WAITING AT ILLINOIS CENTRAL OUT-FREIGHT PLATFORM

MOTOR TRUCK WAITING FOR DOOR AT ILLINOIS PERISHABLE FREIGHT PLATFORM.

truck driver knows that his mileage is only limited by the number of minutes which he can spend on the road and that he has to report to his shipping clerk each night giving reasons for any delay. The motor truck driver, as a rule, is also a higher type of man than a mere teamster and has more interest in accomplishing his work well. At a point where earlier in the day a horse driver had backed his wagon into the wall next to an open door, where another wagon was unloading, so that he could have a sleep, a motor truck driver backed his machine in at an angle, getting the tailgate near enough to the door so that he got off his light load by hand. This took more time in unloading than if it had been done by hand truck but it saved the motor truck the delay of waiting until the horse wagon got out of the way. It costs at present 42½ cents per ton to take the material from the wagon and load it on to the freight cars.

MORNING TRAFFIC AT LAKE SHORE STATION, SHOWING BLOCKADE FORMING

INFLUENCE OF HORSE-PACE. ARROW DENOTES SLEEPING DRIVER

ILLINOIS CENTRAL IN-FREIGHT PLATFORM AT 3 P. M. NO DRIVERS IN SIGHT

The inside arrangements of the Illinois Central freight terminal are very interesting as is also the data dealing with the day's work, as follows:

Incoming freight	1,500,000 pounds
Outgoing freight	4,500,000 pounds
Total	6,000,000 pounds
Cars loaded per day	330
Teams hauling to platform	600
Men employed on platform	158
Hours of work	7 to 5:30

The terminal platform is 1,600 feet long and can take care of possibly 900 vehicles a day. Separate doors are provided for perishable goods, explosives, etc., which must be unloaded in a hurry. As an example of what can be done, 6 tons of fish were unloaded from a wagon in 20 minutes at the perishable goods door. Two men worked on the load with one man inside. The chief congestion of trucking comes between 3:30 and 5:30 p. m. The average load delivery to this platform is about 5,000 pounds.

Since the recent strike was settled a new wage schedule has gone into effect whereby the men receive extra compensation for every increase in the amount of business handled over a certain set standard determined from former experience before the strike. Thus at the present time the hand truckers on the platform do not idle but co-operate in every way to get the greatest amount of business done during the working hours.

New System Inaugurated

The new system of unloading wagons inaugurated during the latter part of September is shown in Fig. 1. Here a truck man with a hand truck takes a box or the like from the pile on the floor at A which has just been taken off of the wagon a. With the hand truck he carries this box to the car proper to the destination as at B. Having delivered the box, instead of walking back to the starting place empty-handed he takes the truck nearest him, as at C with a load, going back to a platform as near as possible to his original place, as at D. From here again he goes back to A for his second hand truck load from that point. In this way idle steps are eliminated. When a box is put on a hand truck it is not taken off until it is delivered at its final destination. As far as possible the merchandise taken from the wagons is deposited immediately upon hand trucks.

The tracks of the Illinois Tunnel Co. are shown at T. The trap cars are brought up to this level by the elevator E from whien they are shoved out onto the track. On Mondays when this track is full of cars, truckers on the platform have to walk clear around the end of the line in delivering goods to the other side.

From the

BUICKS Win Prizes—Buicks took the first two prizes in the recent tour from Birmingham to Meridian, Miss. A 43 model took first place, while the second place went to a Buick 29. The third was awarded a Studebaker 30.

Motorists Help Politicians—For the first time in the history of the state, political parties in Indiana were not permitted to hire vehicles in which to carry voters to the polls at the election on November 5. This was due to the state's recent corrupt practice act. Motor car owners, however, went to the rescue of all of the political parties and furnished each party with all of the motor cars that were needed, free of charge.

Breaks Coast Road Record—The Los Angeles-San Francisco record over what is known as the valley or inland route, one of the road classics of California, was broken last week by a 1913 Cadillac, driven by Charles Soules, the former racing driver. The distance is close to 500 miles, and the Cadillac negotiated the run in 17 hours 5 minutes. This time breaks the old record by 40 minutes. A good part of this week's record run was made in a rainstorm. The successful car was the same one Soules drove in the Los Angeles Phoenix road race a week earlier.

Motor Proves Its Worth—The efficiency of motor fire apparatus and its superiority over horse-drawn vehicles was demonstrated at a railroad wreck in Indianapolis November 13. A passenger train running 50 miles an hour ran into a freight train, killing fifteen passengers and injuring twenty-three others. The wreckage immediately caught fire. It was impossible to extricate the dead and injured from the wreckage without aid and there were no water mains in the vicinity which could be used in fighting the fire. Two motor vehicles, a squad and a combination hose and chemical, each carrying chemical tanks, were summoned from headquarters. They made the run and were at work in 12 minutes, making a run of 6 miles. The fire was quickly extinguished and the dead and injured rescued by the firemen from the wreckage. Had it been necessary to wait for horse-drawn apparatus, many dead and injured would have been consumed by fire. On the strength of the showing made, Fire Chief Charles E. Coots has asked the board of public safety to buy an additional motor hose wagon, a motor ladder truck and three motor runabouts for the use of the assistant chiefs in the department. His request probably will be granted early in the new year.

Recommends Vancouver Island—That Vancouver island, a part of British Columbia, is a motoring paradise is the opinion of Mel G. Johnson, who has just returned from a tour through that section. The island is 350 miles in length, and according to Johnson it is a network of roads, most of which are in fine condition. "Many of the roads we would call boulevards," says Johnson. "I firmly believe that when American motorists have become sufficiently acquainted with the scenic environment of Vancouver island and its beautiful road conditions they will swarm there in large numbers, particularly during the delightful summer season."

Will Celebrate—Plans are being made by the Buffalo and Niagara Falls clubs to hold a joint celebration when the Buffalo-Falls boulevard is opened for traffic the first week in December. An immense parade will be held by the two motor organizations followed by a banquet. This road was to have been opened on November 15, but bad weather caused the work to be held up.

Activity in Louisiana—An effort is being made to add 500 members to the Louisiana Motor League during the winter months. Motoring is at its height in New Orleans during the winter when a large number of visiting cars swell the number owned there. Moreover, in the summer many of the wealthier residents go north, but with the coming of winter they return and cars that have been idle during the summer again add to the animated street scenes that characterize the "winter capital."

Old Route Recommended—Maryland motorists are again being instructed to use the old route via Perryville and Elkton to Philadelphia, as a portion of the new thoroughfare is completed. While the improvements were in progress Secretary Luzius, of the Automobile Club of Maryland, mapped out a temporary route which has been abandoned. The club was instrumental in getting through the $40,000 appropriation for road work in the last legislature and with this appropriation rapid work is being done. Already the route has been graded and the lower surface laid and the entire work will be completed in the spring. As an experiment, 1 or 2 miles of this route will be of macadam with concrete base, while the remainder of the road is of sand, clay and gravel. The club and state road commission will work together for an extra appropriation of $40,000 from the next legislature.

Birmingham Wants Speedway—Birmingham, Ala., is to have a $160,000 speedway modeled after the course at Indianapolis. This announcement was made by the directors of the Edgewood club last week. The movement is being supported by the board of commerce. It is planned to make Birmingham the center of winter racing in the south.

Los Angeles Changes Law—The city of Los Angeles has just enacted an ordinance directed against the use of the bulb horn as a warning signal. The measure is a result of a test by the police department. Members of the traffic squad went up and down the various streets where the parking of cars is permitted and blew the bulb horns attached to some 400 cars. It is stated that of this number but two were found which gave what they termed an adequate warning, one that could be heard 50 feet ahead. The others emitted so slight a sound that it could scarcely be heard at all. In every case it was impossible to obtain anything but an inaudible wheeze when the bulb was grasped quickly, thus demonstrating the uselessness of the bulb horn as an emergency. The test was instigated for the purpose of gaining first-hand information as to the cause of accidents. It was shown, for instance, that of the number of these resulting from the failure to hear horns 77 per cent occurred at the intersections of streets where the

Old Roads Made New

This is the fourth of the series of illustrations made from photographs loaned by the office of public roads at Washington. The camera shows an old road near Spotsylvania, Va.,

Four Winds

noise of traffic is such as to make an efficient signal absolutely necessary. The new ordinance requires the use of a signal capable of producing an "abrupt note, sufficiently loud to serve as an adequate warning," that is, sufficiently loud to be heard under all conditions of traffic. Provision has also been made for the elimination of unnecessary noise by prohibiting the use of such a signal except in its true function: as a warning of danger.

Venezuela Interested—Motor cars are to be used in transporting passengers and freight around the rapids in the upper Orinoco river, according to advices from Thomas W. Voetter, the American consul at La Guaira, Venezuela. Transferring freight at the rapids has been so onerous, without proper transportation facilities, that much of the rubber from this region has found its way to market via the Amazon and Manaos, Brazil, despite the greater distance. The Venezuelan government has pledged a subsidy of $3,860 to the new motor service, which will make better time possible on shipments from the rubber district via the Orinoco.

Sheboygan on the Map—Arthur F. Raab has been elected secretary and treasurer of the Sheboygan Automobile Club, Sheboygan, Wis., which has just been given new life and intends to take an important place in motoring in Wisconsin. The club is affiliated with the Wisconsin State A. A. and thus with the A. A. A., and has for its counsel T. M. Bowler, one of the leading attorneys of the northwest. Mr. Bowler will work with the legislative division of the W. S. A. A. before the coming session of the Wisconsin legislature, convening in January. Secretary Raab and the committee on runs and tours is now making preliminary preparations for a reliability tour of probably 2 days' duration. Team matches with the Milwaukee Automobile Club are also figured upon. It is also proposed to establish club rooms at some convenient downtown point until such a time that a clubhouse can be built.

Has Body Match Bonnet—During the present selling season H. A. Moyer, of Syracuse, manufacturer of the motor car of that name, received an order for a 1913 touring car with the request that he "paint the car a color that will match the shade of this bonnet." This particularly feminine request came from Mrs. T. E. Powers, wife of the New York cartoonist. Accompanying the order was a dainty motoring bonnet of a delicate robin's egg blue and several sketches in colors intended to guide the body finishers.

Wants Owners' Finger Prints—Superintendent of Police Regan, of Buffalo, N. Y., is heartily in favor of the plan recently outlined by State Secretary Lazansky of recording finger prints of all chauffeurs and car owners to prevent gangsters and gunmen from securing licenses. "Of course, many owners might object to giving their finger prints," said Chief Regan, "but after the advantage of the plan is shown I believe the majority would be willing."

Would Widen Government Road—An appropriation of $300,000 to be made in four annual installments, for widening and macadamizing the government road from the western boundary of the Mt. Tacoma national park to its terminus in Paradise valley is recommended in the annual report of the park superintendent, Edward S. Hall. If the government is unwilling to improve the road, Mr. Hall suggests that it be turned over to Pierce county or the state of Washington, which would gladly make the much-needed improvement. During the 1912 season 869 car permits were issued and this number entered the Mt. Tacoma National park. The speed limit in the park is 15 miles an hour and at abrupt curves this is reduced, signs being placed at points along the road indicating the rate of speed allowed. No accidents of serious nature have occurred.

Proposed Ohio Legislation—Considerable interest in Ohio has been aroused by the movement of the Cleveland and Columbus clubs to secure the passage of a law by the next general assembly making it a penitentiary offense to steal a car. The sentence proposed is from 1 to 7 years. It also is proposed to have a bill enacted requiring all horse-drawn vehicles to carry both front and rear lights on all public highways of the state after dark. This law will be drafted to follow the outline of an ordinance recently passed by the Columbus city council.

Pennsylvania Tag Requirements—After January 1, 1913, every person operating a car in Pennsylvania, with the exception of registered owners, must procure a driver's license. The fee for this is $2. Heretofore a registered owner could designate any member of his family over 18 years of age to drive his car, or any friend or person not in his employ as a chauffeur. Joint ownership registration will also be discontinued. Applicants for registration for 1913 must furnish the name, model, year manufactured, S. A. E. rating, diameter of bore and number of cylinders, in addition to the usual information.

Winter Harbor Likes Motorists—In contrast to the sentiment of Bar Harbor, Me., where motor cars are excluded is that of Winter Harbor, a resort within a few miles of it where motorists are welcomed. In the last issue of the Bar Harbor Record was the following from the Winter Harbor correspondent: "Eighteen cars were here the past summer, including the public ones, and while they have been very much in evidence on the roads, they have not been the least objectionable. Speeding has not been indulged in, and they have been the life of the town. We miss them dreadfully. Not an accident happened to the machines or the horses."

Missouri Road Men Organize—Motorists, highway engineers and good roads enthusiasts from all parts of Missouri gathered at Jefferson City, November 13, and formed a permanent organization for the agitation and building of good roads throughout the state. The organization is known as the Missouri Highway Association. Roy F. Britton, chairman of the legislative committee and former president of the Automobile Club of St. Louis, was elected president of the new association. It is proposed that the new organization, with the aid of the motor clubs and associations and other similar organizations, will work for effective legislation and the passage of such laws as will expedite the establishing of a perfect system of highways throughout Missouri.

No. 4—In Virginia

and the same road after it was remade. This comparison furnishes an object lesson that can be effectively used by good roads enthusiasts

Fiat Adds a Big Four to 1913 Line

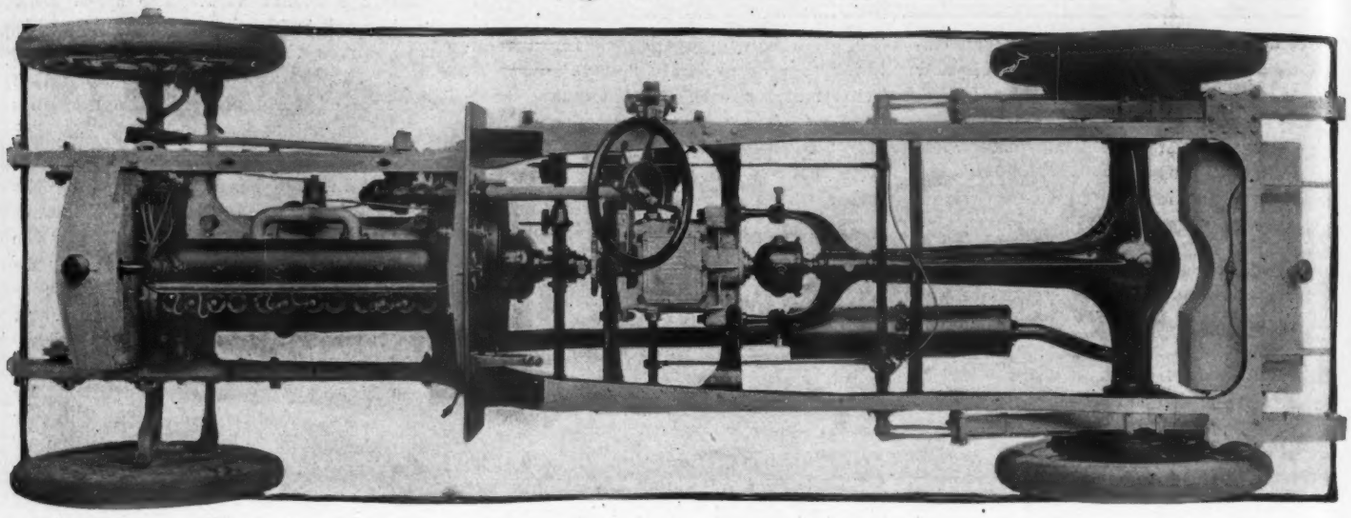


FIG. 1—TOP VIEW OF FIAT SIX-CYLINDER CHASSIS

Model 55 Latest Production of Poughkeepsie Factory for New Season—Evidences of Fine Italian Hand Apparent

FROM the day of the initial announcement of the Fiat car from its factory at Turin, Italy, until the present the name Fiat has been more or less closely associated with speed events in Europe and America, a racing machine of this make winning three of the four American grand prize races; but while the car has attained the highest honors in road racing through special motor types the company has been steadily developing its touring models and incorporating into them from time to time those designs and materials which the strenuous speed campaigns have dictated as valuable.

Evolution of American Fiat

In America the touring models have been imported in large numbers annually and continue to be imported but in order to avoid some of the 45 per cent ad valorem duty the American importers and the parent factory united in the building of a plant at Poughkeepsie, N. Y.., 75 miles north of New York city on the Hudson.

Ground for this factory was broken on October 12, 1909; a year later, October 11, 1910, the first American-built Fiat was put on the road and since then the Poughkeepsie factory has been turning out American-built cars in various models, using in these many parts brought direct from the Turin factory, and being built from start to finish under the direction of Fiat engineers from the home factory and from working drawings from Turin.. The materials used, the workmanship done on the various parts, the allowances in bearings, the physical tests of materials, and in fact everything done in the American plant is the same as done abroad.

During the first year of American manufacture, the 1910 season, but one model was produced; for 1911 this was continued and another added; and for next year a third model is added and the other two carried along in improved form. Here are the three models:

Model	No. cyls.	Bore —M. M.—	Stroke —M. M.—	Bore —Inches—	Stroke —Inches—	Rated H. P.
54	4	110	150	4 2/5	6	35
55	4	130	170	5 1/8	6 3/4	55
56	6	110	150	4 2/5	6	54

Model 54, a small four, was brought out first, then 56 the six-cylinder model, and 55 the big four, has been added for next season. The general design of all three models is alike: They all use block cylinders with valves on one side; all use a multiple-disk clutch; all are fitted with a four-speed gearset; all of them use the characteristic Fiat rear axle construction in which the axle housing and torque tube for the propellershaft are in one and of unique shape; and all are alike in the use of the robust frame design of Fiat creation which has been so widely imitated in this country.

Although the three models brought out in three successive seasons are of different motor sizes, and the same general design there are few details in the latest that is not in the earliest, a fact which tells more emphatically than words that the

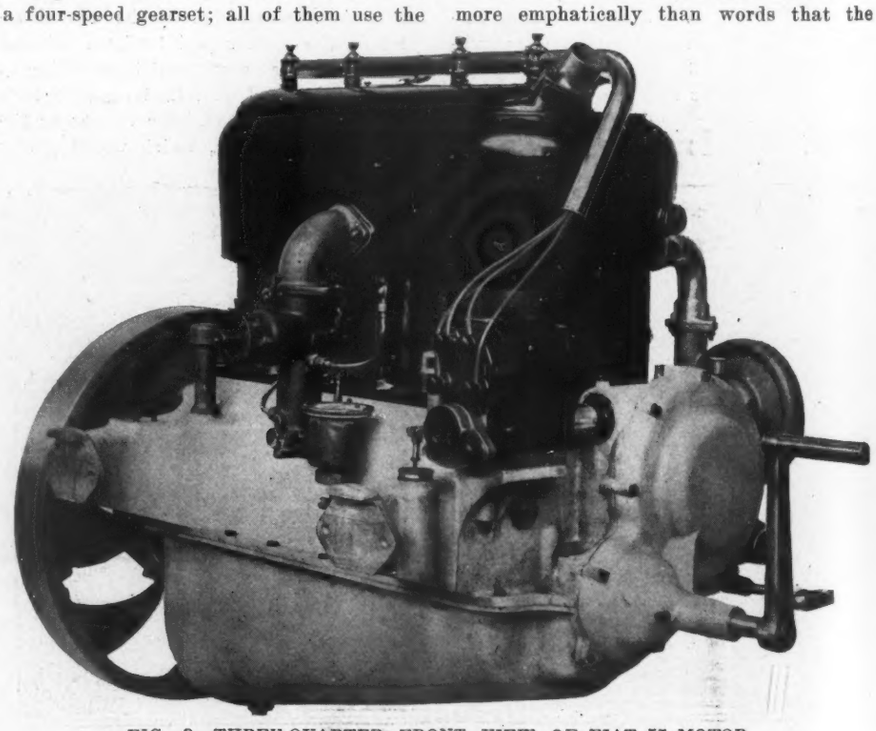


FIG. 2—THREE-QUARTER FRONT VIEW OF FIAT 55 MOTOR

Details of American-Built European Car

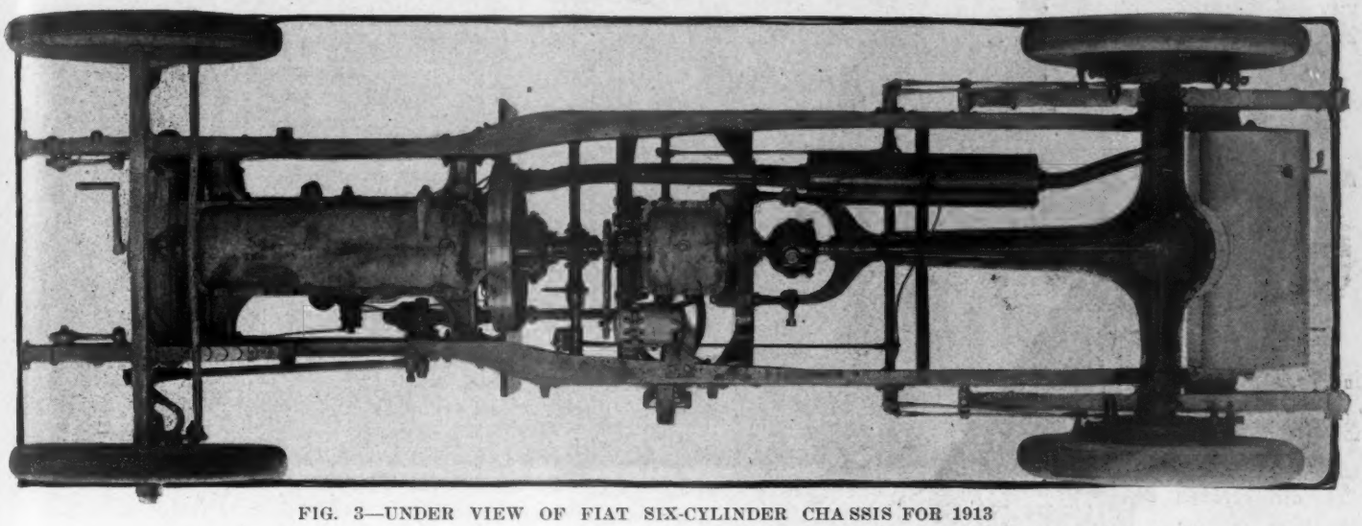


FIG. 3—UNDER VIEW OF FIAT SIX-CYLINDER CHASSIS FOR 1913

Minor Refinements in Three Chassis for Next Year—Compression Release a Feature—Noiseless Operation Aim of Designers

present car is not a novelty in any respect but an evolution, the origin of which can be traced to the Italian engineering rooms of several years ago. True, the new 55 has a few features that the little four model and the six have not. One of these is a compression release on the camshaft to facilitate cranking, a self-starter not being fitted to any of the models.

The Fiat chassis Fig. 1 is conventional. The motor is hung direct at four points on the frame side members; the multiple-disk clutch is contained in the drum-type hub of the flywheel; the exceptionally compact gearbox is hung amidships on two cross members, a rigid four-point support; and the rear system ends in a yoke which pivots to a pair of arms on a cross member. The brakes are internal and external on the rear hubs; rear springs are three-quarter elliptics; and pressure feed on the gasoline is used.

The top chassis reproduction and the under chassis one Fig. 2 both exhibit a cardinal feature of the car, namely symmetry of design. There is not any mussing up of parts, every part is designed for its work, has its place assigned to it and looks an integral part of the entire creation. It is as clean-cut a design as is on the market today and bears many examples of the Italian art of simplicity, accessibility and competency.

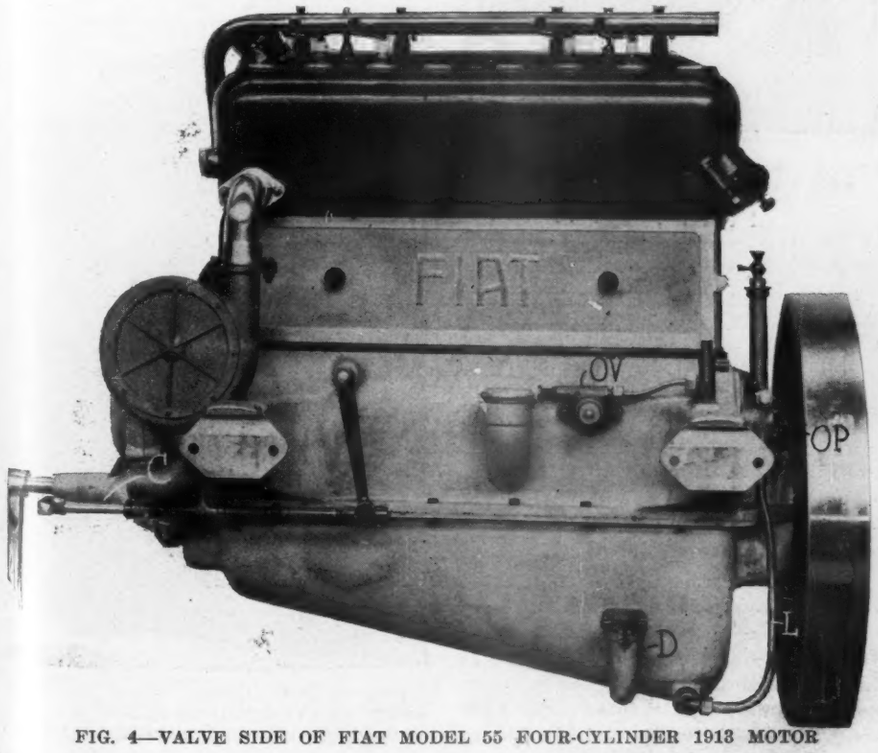


FIG. 4—VALVE SIDE OF FIAT MODEL 55 FOUR-CYLINDER 1913 MOTOR

The clean cut appearence of the motor Fig. 4 the valve side of the new 55 and Fig. 2 a three-quarter front view of the left side completes the general conception of this power plant. Across the front is a transverse shaft with the magneto on the right end, the water pump on the left. Centrally on the right side is the carburetor with intake manifold but an elbow in the four and a short stemless T piece in the six. On the left side a reminder of valves is eliminated by the oblong aluminum cover concealing the stems carrying the firm name. The only parts on this side are the oil filler pipe for the crankcase, the oil check valve and on the 55 connections C for the compression release.

A Compact Motor

The aluminum crankcase, a product of the factory foundry, is made in halves, the upper supporting all bearings as well as supporting arms, the lower being but an oil reservoir tapering gradually to the flywheel end. Using a block casting gives compactness. The casting for the six Fig. 13 measures 37 inches long over all, 13.75 inches high, and 11 inches wide. On the four-cylinder model 55, the casting length measures 28.5 inches.

Every care is used in the manufacture of the moving parts. The three-bearing crankshaft is a chrome-nickle alloy with a tensile strength of 125,000 pounds; it is hollow to facilitate lubrication, and, to insure rigidity, reinforcing plates are inserted to the lower caps of the main bearings, these being carbon steel forgings and the bearing cap is held by four alloy steel studs for each bearing.

Fiat motor lubrication is non-splash;

speaking positively, it is forced-feed to all bearings and the wrist pins included.

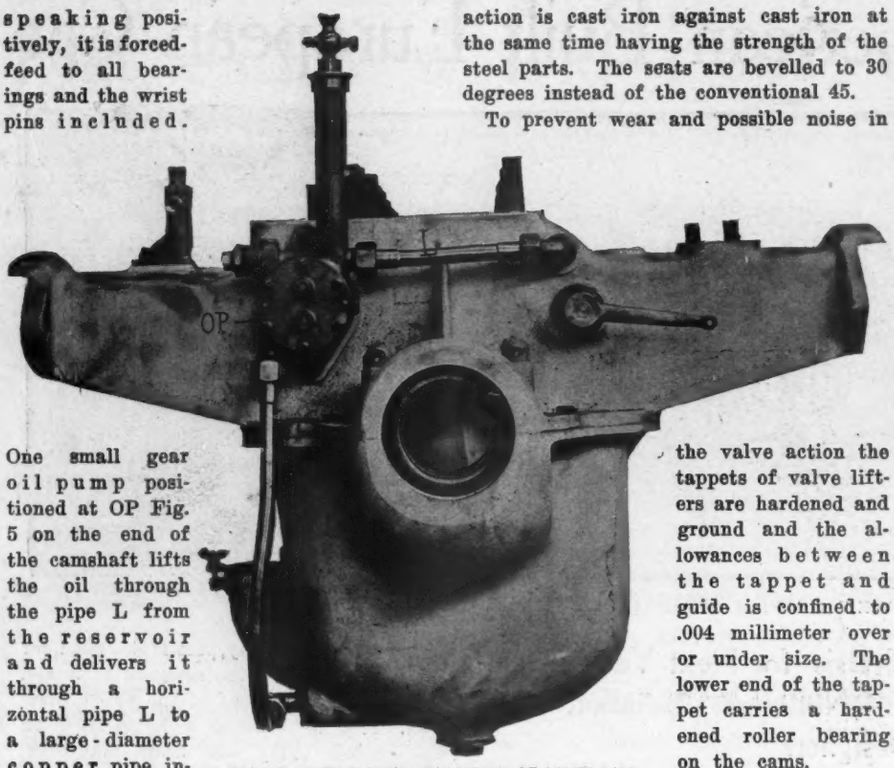


FIG. 5—REAR END OF FIAT CRANKCASE SHOWING OIL PUMP AND OIL PIPES

One small gear oil pump positioned at OP Fig. 5 on the end of the camshaft lifts the oil through the pipe L from the reservoir and delivers it through a horizontal pipe L to a large-diameter copper pipe inserted, during the casting process, in the side of the crankcase and extending from end to end. From this duct branches lead to the three main bearings and from these the oil flow is through the drilled crankshaft to the lower connecting rod bearings. Each connecting rod carries a small copper pipe which conveys the oil from the lower connecting rod bearings to the upper one or wrist pin. The wrist pine is hollow and the oil flows through it against the cylinder sides. Thus is there a positive oiling and to avoid too much reaching the cylinder walls in the form of a mist thrown off from the crankshaft integral baffle plates in the top of the crankcase fill the entire circular opening into which the lower end of each cylinder fits, there remaining but a slot wide enough for the connecting rod to work through. The crankcase capacity is 4 to 5 gallons of lubricant. On the left side Fig. 4 is a safety check valve OV forming a bypass between the pump and the crankcase. There is a drain D for the reservoir. As in all circulating systems the oil is filtered through screens between successive circuits, this motor having double screens, one between the reservoir and the pump and the other between the pump discharge and the bearings.

Novel Valve Construction

The new 55 is a particularly quiet motor for one having poppet-valve action, but every effort of the engineering department has been focussed on the best valve operation. To insure freedom from valve pitting three materials are used in the valves: The stems are carbon steel, the heads are nickel steel and on the bevelled part is a ring of cast iron so that the actual valve action is cast iron against cast iron at the same time having the strength of the steel parts. The seats are bevelled to 30 degrees instead of the conventional 45.

To prevent wear and possible noise in the valve action the tappets of valve lifters are hardened and ground and the allowances between the tappet and guide is confined to .004 millimeter over or under size. The lower end of the tappet carries a hardened roller bearing on the cams.

The care exercised in the valve actuation is shown through the other internals of the motor: The camshaft has separate cams mounted in pairs, an intake and an exhaust made from a single forging. The pair is keyed and pinned to the shaft, and the object of using separate instead of integral cams is that with separate cams the camshaft can be carried on non-split bushings which are desirable, whereas with integral cams split bushings are necessary. Each cam surface is tested with the sclerescope to determine if the hardness of all cams is the same.

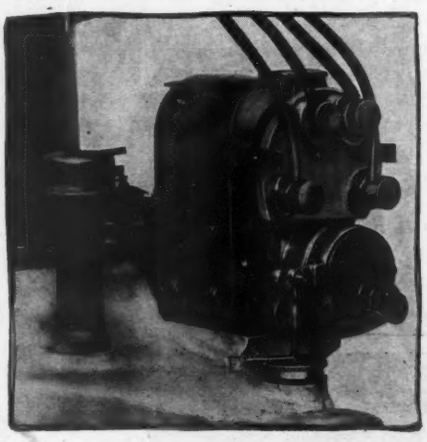


FIG. 6—HOW MAGNETO CONNECTIONS ARE CARRIED INSIDE CRANKCASE

The compression release of model 55 consists of sliding the camshaft endwise, forward and lifting the exhaust valve of the firing cylinder off its seat. In order to move the entire shaft endwise intake cams are made double width and the timing gear on the front end of the shaft is neatly secured, Fig. 7 in that the end of the shaft carries a two-arm yoke Y with an eye hole in each arm fitting over a short stud in the gear wheel so that as the shaft is moved endwise the wheel remains stationary, the positive drive being through the yoke and studs.

A commendably neat feature of the Bosch dual ignition system is the connection between the steering column and the magneto, which is carried from front to rear of the motor through the crankcase. Fig. 6 shows the magneto in position with a short link entering the crankcase and hinging with a rod which exits from the rear and takes an arm EI, Fig. 8, which arm has direct connection with the steering gear control through link E2, and arm E3 carried on the sleeve E4 which is raised or lowered on the column through the steering wheel lever. The entire control is hidden and robust.

Details of Clutch

For convenience the transmission system may be considered in three units, clutch, gearset and rear axle: The multiple-disk clutch carried in the drum expansion of the flywheel hub is made of sixty-five steel disks in two sets, thirty-two disks D, Fig. 9 attached to a carrier C on the clutch shaft which extends rearward to the gearset; and thirty-three disks DI which anchor to the drum carrier CI, which drum is bolted to the flywheel, so that these disks revolve with the flywheel.

The four-speed gearbox, Fig. 10, has compactness as one of its cardinal virtues. Although affording four forward variations the gearbox measures but 10 inches from the center of the front bearings to the center of the rear ones. Shafts

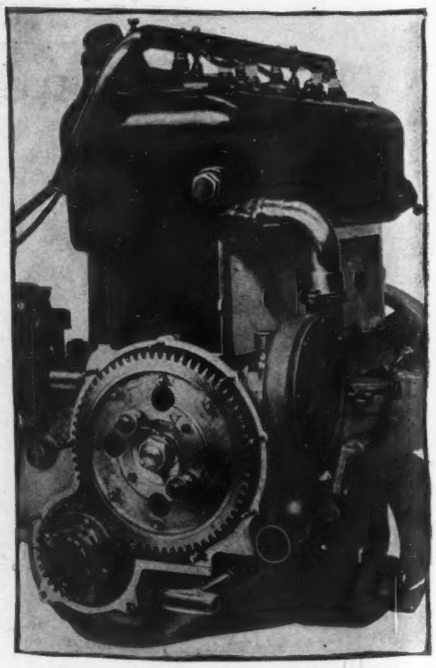


FIG. 7—HOW TIMING GEAR ON CAMSHAFT IS ATTACHED TO ALLOW SLIDING CAMSHAFT FOR COMPRESSION RELEASE

FIG. 8—CONNECTIONS ON STEERING COLUMN FOR CARBURETER AND MAGNETO

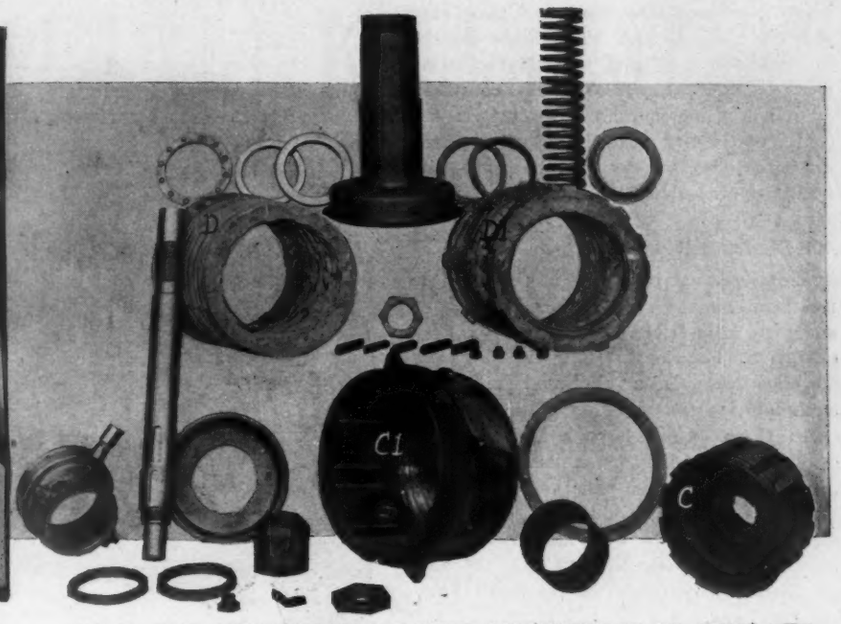


FIG. 9—FIAT MULTIPLE-DISK CLUTCH DISASSEMBLED TO SHOW THE DETAILS OF CONSTRUCTION

and gears are alloy steel and seven sets of ball bearings are used in it. In design the gearset is a cart-before-the-horse style as compared with the conventional set, in that the mainshaft extends from front to rear and the stub shaft in line with it is at the rear and connects through the universal joint with the propeller shaft.

Gearset Construction

The mainshaft has four integral splines on which the sliding gears move and at the rear it is carried on a ball bearing located within the hollow end of the stub-shaft. A ball bearing here simplifies lubrication. The short stub shaft measuring but 10 inches from end to end is carried on three races of ball bearings two races close together in the case proper and a single race 3 inches further to the rear and mounted in a neck or continuation of the case. Using three bearings gives rigidity to a short shaft and insures accurate gear meshing.

The combined torque tube and rear axle housing is one of the interest centers of the car. Fig. 11 shows the scheme: This housing is a two-part stamping of heat-treated steel made in the Turin factory and imported in the rough. Each half weighs when received 41 pounds so that the completed housing is well under the 80-pound mark when completed. These stampings are of 50 point carbon manganese steel 4 millimeters or approximately ⅛ inch, thick. These stampings call for special accuracy in manufacture in order to have the axle drive shafts and the propeller shaft mounted accurately to get quiet meshing of the driving pinion and the differential bevel, accuracy imperative in such a construction because noisy gears would have their noises intensified by the thin drum-like housing.

Fig. 12 shows one of the housing stampings with a fixture in position to make certain that the bracket B to take the pinion bearing is positively at right angles to the brackets BI on which the differential is carried. All of these brackets are steel casting riveted in position. The fixture F has circular end pieces of equal size with the bearings supporting the differential and rest on the brackets BI, so that when the reamer or cutter K on the shaft KI is used to finish the bracket B the utmost accuracy is obtained. When this reaming is being done the upper half of the housing is bolted in place, but was removed when photographed to show the means of obtaining accuracy and so quiet gears.

Special accuracy is also needed in facing the flanges which come together when the halves are bolted together. These flanges are hand filed all over, finished with emery cloth and shellaced. They are then tested on a huge metal surface plate and finally held together by ⅜-inch cold-rolled steel bolts, placed 4.5 inches apart on the straight portions and closer on the curved portions around the differential where the strains are greater. Both axle drive shafts are mounted on R. I. V. annular ball bearings and the shafts are not removable. At their outer ends the road wheels are fitted on a taper and keyed to them. The axle is non-adjustable, the factory advancing this as one of its great merits, on the ground that to adjust a rear axle is a service building job and one which should be taken entirely out of the hands of the owner.

Fiat Running Gear

The running gear parts include internal and external rear-wheel brakes, both sets faced with raybestos. The drums are stampings 2.75 inches wide and 16.5 inches in diameter. The steering gear is a worm-and-gear type, with worm and gear forged integrally with its respective shafts. All control is on the right side.

In designing the front axle the aim has

FIG. 10—FIAT SELECTIVE FOUR-SPEED GEARSET, SPECIALLY COMPACT

been to reduce tire wear and give easy steering. To do this the wheels camber in at the bottom and the vertical pivot of the steering knuckle points out and if extended would meet the ground in the center of the tire tread, thereby giving the minimum tire wear when turning and when running. Ball-and-socket joints are used everywhere in the steering gear.

Full-Dinner Pail Equipment

These joints at both ends of the cross tie rod between the steering arm permit of accurate adjustment and also give easy operation. For the first time the Fiat company has scheduled a full-dinner pail equipment which is standard on all models.

All three models have a standard line of bodies, including seven-passenger touring types in curved panel or flush-sided styles; five-passenger phaeton; convertible roadster; limousine and landaulet. The wheelbase measurements are 123, 128 and 135 inches respectively on the small four, big four and six.

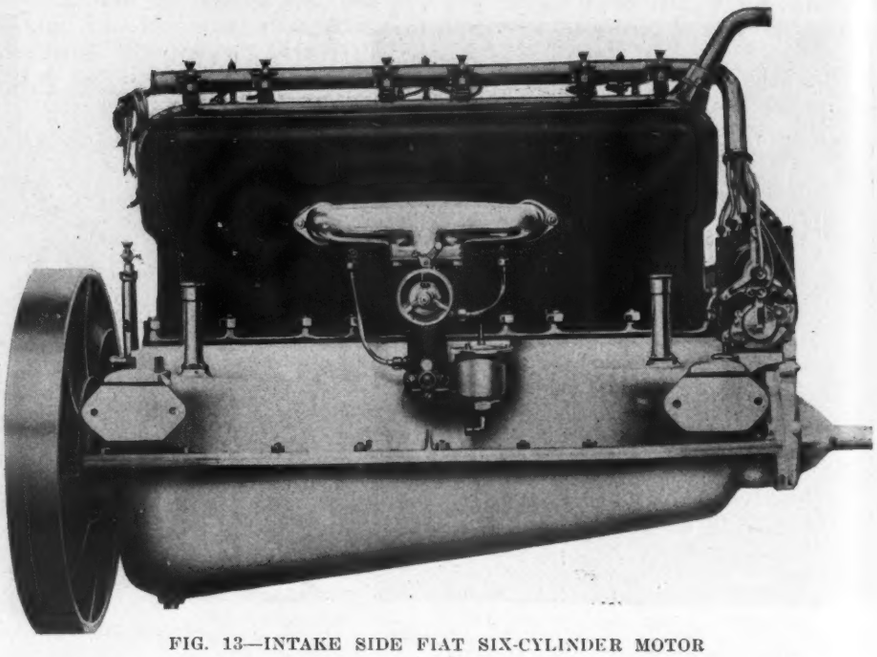


FIG. 13—INTAKE SIDE FIAT SIX-CYLINDER MOTOR

The Motorists' Bookman

Historic Summer Haunts

F. LAURISTON BULLARD in his "Historic Summer Haunts from Newport to Portland," says: "In Newport, if anywhere in America, the past seems to contemplate with stately dignity the vanities of the present. The mind runs to history in Newport as naturally as to shoes in Lynn or to textiles in Fall River." The same may be said of all the historic old towns that the author has described in so charming and instructive a manner that one forgets it is history and not romance one is reading. "Spend an hour in old Marblehead," he says, "and you will like it; spend a day in the town longing for its sunset and moonlight view of the bay and you will love it." The volume is well illustrated and should make a splendid gift book. For the motorist who may even now be planning his next summer's tour in the east, the book has its significance. Little, Brown & Co., Boston.

Fascinations of England and France

Julia de W. Addison finds the charm of old England lies in the history that is so intimately connected with every part of it. Each small town and cross-roads seems to be connected with the life of the nation. Caroline Atwater Mason, writing of the spell of France, attributes it not only to the historic and legend-haunted castles, its pastures, orchards and vineyards, but to the smiling skies and balmy air of the Mediterranean coast and the beauty of the Pyrenees. And in her descriptions she has surely conveyed some of its enchantment. These two volumes under the titles of "The Spell of England" and "The Spell of France" are published by L. C. Page & Co., Boston, Mass.

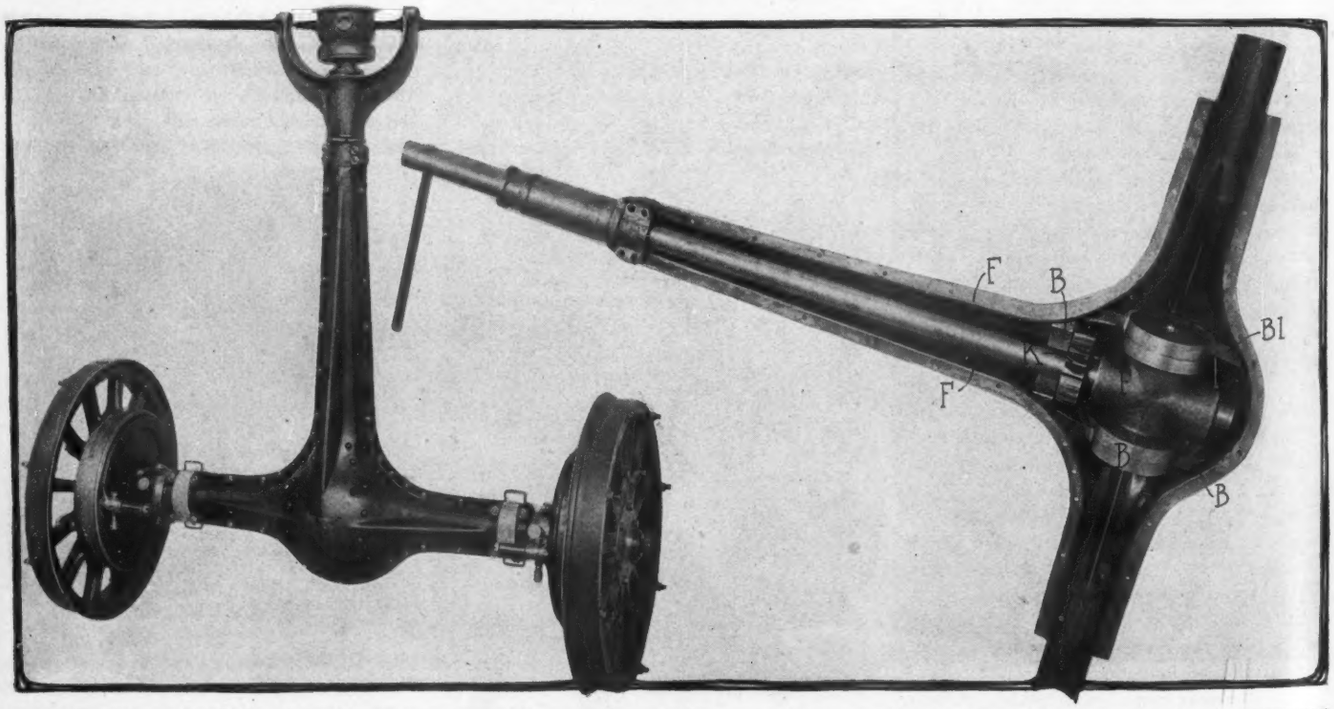


FIG. 11—FIAT REAR AXLE AND TORQUE TUBE MADE OF TWO PRESSED STEEL PIECES BOLTED TOGETHER—FIG. 12—FIXTURE TO INSURE MOUNTING AXLE BEARING ACCURATELY

The Motorist's Kindergarten

EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car.. The first article appeared October 10, 1912.

AS well may be imagined, the repeated burning of the charges of gas in the cylinder of the motor liberates a great deal of heat and the walls of the cylinder get hot just as the barrel of the repeating rifle gets hot when fired many times in succession. Without some means of taking this heat away from the metal parts of the motor it would get so hot that the piston would stick in the cylinder, the valves warp and the bearings be burned out.

There are two methods used for cooling the motor, one known as air-cooling and the other as water-cooling. Water cooling is the much more usual in form in motor car engines, particularly in pleasure cars, although there are one or two noteworthy examples of successful air cooling in this field.

For water-cooling of cylinders, when the cylinder is cast, there is left in the casting a space called the waterjacket space, or more briefly the waterjacket. This surrounds the entire upper portion of the cylinder and the cylinder head. There are, then, virtually two walls to the cylinder, the inner one which forms the cylinder wall proper, and the outer one, which is the waterjacket wall. Between these two is the waterjacket space. There are two openings to the outside from the waterjacket space, one at the top of the cylinder and the other at the bottom of the waterjacket.

If water is forced in at one of these openings and out at the other it will flow through the waterjacket and take up the heat from the inside cylinder wall, coming out hot and keeping the cylinder wall comparatively cool. In marine engine practice it is done just this way. Water from the lake or river is forced through the waterjacket and out into the lake or river again. It is forced through the waterjacket by a small pump geared to the motor.

In the motor car, however, we have not the inexhaustible supply of water that we have with a boat, so we must use the same water over and over again. Therefore, it is necessary to cool the water after it has become hot from its passage around the cylinder. This is done by the radiator, which performs the double function of cooler and water supply tank. In the radiator, the water is made to flow through very small passages, usually from the top to the bottom. These passages have very thin metal walls and between them air is drawn by a fan behind the radiator.

Water-Cooling Types

The water gives up some of its heat to the walls of each part of the passages through which it flows, and the air flowing past the outside of the metal passages takes the heat away from them in turn. The water is divided by these small passages into very thin streams so that it gives up its heat quickly and is cool by the time it reaches the bottom of the radiator.

These passages may be flat or round tubes and may be vertical or horizontal, or there may be both horizontal and vertical passages interconnected so that the water runs across the radiator as well as up and down. Those radiators in which the passages run only up and down or across, being only interconnected at their ends are called tubular radiators and those in which the passages are interconnected throughout so that the water has several branches to flow through at any point are called cellular or honeycomb, from their resemblance to the honeycomb of a beehive. These different types will be explained more in detail later as it is the intention here to give the reader only the general arrangement of the various systems of the motor without going into the details of construction at the outset.

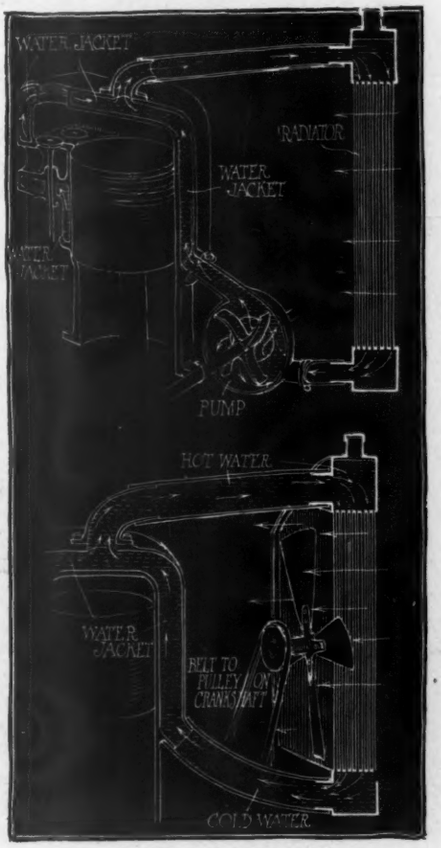


FIG. 9—PUMP AND THERMO-SYPHON WATER CIRCULATION

There are two different methods of making the water circulate through the cooling system. One of these is by means of a small pump operated by the engine. This forces the water in at the bottom of the jackets, out at the top, into the top of the radiator, through the radiator and out of the bottom to the jackets again. This is illustrated in the upper view, Fig. 9. Sometimes the direction of flow is reversed, but the one mentioned is more usual. Where a pump is used to keep the water going cooling is said to be by pump circulation.

In many motors no pump is used to maintain circulation of the cooling water, but the natural expansion of water when heated is allowed to produce the flow. This is what is called thermo-siphon circulation. When water is heated it expands and hot water is therefore lighter than cold water. If a pan full of water is heated on the bottom the hot water will immediately rise to the top, because it is lighter than the colder water above it. The cold water will settle to the bottom, get hot and rise.

The same thing happens in the thermo-syphon cooling system. Suppose we have the waterjacket connected by a pipe or hose from the top of the cylinder to the top of the radiator and from the bottom of the radiator to the bottom of the waterjacket, without any pump in the circuit. This is shown at bottom of Fig. 9. When the motor is started up the water around the cylinder gets hot, and forces its way upward, going up through the pipes to the top of the radiator which is higher than the top of the cylinder. Meantime the cooler water is forced by the pressure of the hot water above it from the bottom of the radiator to the bottom of the waterjackets where it too gets hot and starts to rise. When the hot water gets to the top of the radiator the air passing through the latter starts to cool the water and its gets heavier. At the same time it is being forced down by the pressure of the hot water behind it. Its passage from the top to the bottom of the radiator cools it still more, so that it is fairly cool by the time it reaches the jackets ready to do its work over again.

Among the Makers and Dealers

BIG Pittsburgh Fire—Fire in the garage of the Pioneer Motor Car Co., 5864 and 5866 Baum street, Pittsburgh, Pa., on the evening of November 15, caused a loss of about $30,000. A loss of $500 was suffered by the Iron City Tire and Repair Co., which occupies an adjoining building.

Gramm Finishes First Truck—The first truck completed by the Gramm-Bernstein Co., at Lima, O., was finished recently. It is of 3½ tons capacity, and the company will complete 250 of them by spring. The plant has been in operation for about 4 weeks and employs seventy-five men. The truck will bear the trade mark, "The World's Best."

Would Build for Farmers—G. W. Swartz, of Salome, Ariz., hopes to obtain local financial support in a factory he proposes to locate in Louisville, Ky. He contemplates the manufacture of a farm truck exclusively, which is designed to answer the various needs of the farmer. Mr. Swartz wants to capitalize the company at $1,000,000.

Van Auken Choose Pontiac—It is understood that the Van Auken electric commercial car will be manufactured in Pontiac, Mich., provided sufficient inducement is offered to warrant either the building or equipping of a plant there. The truck has a capacity of about 1 ton and is the design of C. M. Van Auken and G. S. Jacobs. It made its appearance about 6 months ago.

One Quits, Another Starts—Declaring that a year's trial has proved that the taxicab business in Wilmington, Del., is unprofitable, G. P. Postles announces that he has discontinued his service, which has been the only regular taxicab service in the city. A new one has just been inaugurated by the T. C. Bradford Co., which was started as soon as the Postles announcement was made.

Ottawa Show Plant—Next year's motor show in Ottawa, Ont., which will be held in Howick hall from February 11 to 15, promises to be the largest ever held in Canada. Practically all the space in the hall has been taken by local and other dealers. The show will be run under the auspices of the Ottawa Valley Motor Car Association and Ottawa motor car dealers. Louis Blumenstein will act as manager.

Keeps Plant Clean—Cleanliness is made an important factor in the Elyria, O., plant of the Garford Co., maker of Garford passenger and commercial motor vehicles. Every department of the big plant is kept as clean and free from litter as a big force of shop white wings constantly on duty during working hours can make it. Parts and materials are neatly piled, the passageways are never obstructed. In the automatic screw-machine room several men are kept busy all the time, carrying stock in and out and sprinkling sawdust on the floors to take up oil splashing from the machines.

Convicts Make a Car—Convicts at Sing Sing prison, N. Y., have just completed the construction of a motor car with the exception of the engine, which was purchased. Commissioner Edwards, of the street cleaning department of New York city will inspect the machine and if satisfactory it will be purchased and installed in the street cleaning department of the metropolis at a cost of $5,000.

Michelin Builds Another Addition—A large wing is being added to building 14 at the plant of the Michelin Tire Co., Milltown, N. J. This addition comprises 46,540 square feet of floor space. The new wing is one story high with a second story of 18,770 square feet over one section. This building is of reinforced concrete. The roof is of saw-tooth pattern, light and ventilation coming from above.

Changes in Engine Concern—Interests of President Warner and Secretary-treasurer Kaiser and others in the Milwaukee Motor Co., of Milwaukee, maker of engines, have been purchased by J. C. Coerper, August F. John, Harry G. John, Ernst Miller and James S. Church. Mr. Coerper has been elected president, A. F, John vice-president and general manager and Harry G. John secretary and treasurer.

Bosch Out of Shows—For the first time since 1909 the Bosch Magneto Co. will not exhibit its product at either the New York or Chicago shows. Cancellation was made of applications to the Motor and Accessory Manufacturers for space, because of the booths assigned being deemed too small for exhibition purposes. The Bosch company will keep open house at its New York and Chicago branches during the shows.

Toledo Plans a Show—The Toledo Auto Shows Co., of Toledo, O., has been incorporated by J. W. Banting, A. A. Atwood, H. W. Blevins, Guy R. Ford and others. The capital stock named was $10,000 and the company was incorporated for the purpose of putting on a Toledo show this winter in the Terminal building. While the date has not yet been definitely set, it probably will be early in February.

Richter Made Receiver—John J. Richter, of Laporte, Ind., has been appointed receiver of the Laporte Carriage Co., of Laporte, Ind., giving a bond of $10,000. The receiver was appointed in the federal court by Judge Albert B. Anderson, at Indianapolis. The receivership was created on the application of the Lackawanna Leather Co., of Chicago; the Hackettstown National Bank, of New Jersey, and M. M. Kates, of Chicago. In addition to the application for a receiver a petition was filed asking that the carriage company be declared a bankrupt. The company manufactures motor car bodies and buggies.

Lauth-Juergens Doing Well—The Lauth-Juergens Co., which removed to Fremont, O., from Chicago several years ago, under a bonus, is reported as getting along very well and now is employing 100 men, with an average payroll daily of $300. Most of the output is going to Boston and the east.

De Soto Incorporates—With an authorized capitalization of $20,000, the De Soto Motor Car Co. has been organized and incorporated at Auburn, Ind., to conduct a motor car manufacturing business. The directors and principal stockholders are L. M. Field, of Auburn; Hayes Fry and Glenn Fry, of Iowa City, Ia., and V. Van Sickle and H. J. Clark, of Des Moines, Ia.

Frontier Election—At the annual meeting of the stockholders of the Frontier Tire and Rubber Co., Buffalo, N. Y., officers were elected for the ensuing year, Orson E. Yeager being chosen president, while Frank V. E. Bardol and John W. Gibbs were chosen first and second vice-presidents respectively. George T. Roberts was elected treasurer, while M. F. Dirnberger, Jr., was elected secretary, with A. R. Robertson as assistant secretary and treasurer. W. R. Price was selected as general manager for the coming year.

Oliver Reorganized—All the property of the defunct Oliver Motor Car Co., of Detroit, has been purchased from the receiver by a recently organized company known as the Oliver Motor Truck Co., which will be located at 460 Lawton avenue. G. A. Meyer is president of the new firm; F. J. Meyer is treasurer, and R. F. Beach will have charge of the sales. It is the intention of the new company to manufacture the Oliver 1,500-pound light delivery car and the 3,000-pound type, with a few changes made for the betterment of these machines.

To Make Tractors—The Wallis Tractor Co., capital $800,000, organized at Racine, Wis., by H. M. Wallis and other interests identified with the J. I. Case Plow Works, will engage at once in the production of tractors, tools, machinery and internal combustion engines. Temporary quarters have been arranged in the Case plow works, but a new plant will be erected as soon as possible. The principal stockholder is H. M. Wallis, who has been working on the development of tractors and new types of internal combustion motors for several years. Officers have not yet been elected by the corporation, nor have definite plans concerning the output been

made public. The J. I. Case Plow Works has no connection with the J. I. Case Threshing Machine Co., which produces Case motor cars.

Another Drawback Granted—The regulations issued by the treasury department at Washington on March 28, 1911, providing for the allowance of drawback on motor car top rubberized fabric, manufactured by the Archer Rubber Co., of Milford Mass., with the use of imported mohair cloth and cotton mohair cloth, have been extended to cover motor car covering cloth manufactured by the International Rubber Co., of New York.

Baker's October Business—The sales increase in the pleasure car department of the Baker company for October, 1912, shows a net gain over October, 1911, of 123 per cent. This is 36½ per cent higher than the total sales for April, 1911, which marked previously the greatest monthly volume of sales in the history of the Baker company.

Join M. and A. M.—The following have been elected to membership in the Motor and Accessory Manufacturers: John W. Blackledge Mfg. Co., manufacturer of auxiliary springs and shackles and accessories, Chicago; James L. Gibney Rubber Co., manufacturer of rubber tires, rubber goods and vulcanizers, Philadelphia, Pa.; Westinghouse Electric and Mfg. Co., manufacturer of electric vehicle motors, ignition and lighting outfits, East Pittsburgh, Pa.

New Orleans Show in February—With the last week in February selected for the 1913 show, New Orleans dealers have begun laying plans for the most pretentious event of this kind ever attempted in this city. At a meeting of the New Orleans Automobile Dealers' Association it was decided to place the management of the exhibition in the hands of T. C. Campbell, who was responsible for the success of the 1912 show.

Marion Agent Killed—Alfred L. Dinnin, who had the agency in Boston for the Marion car, was killed a few days ago when his car overturned as he was backing it on a narrow roadway where there was a steep bank on his left, the rear wheel leaving the road, causing an upset that pinned Dinnin under the machine, killing him instantly. His two companions escaped injury. He was formerly connected with the Connell & McCone Co., Boston agents for the Overland.

Election at Rochester—At the annual meeting and election of officers of the Rochester Automobile Dealers' Association, of Rochester, N. Y., Frank W. Peck was unanimously re-elected president, while C. E. Hartson was chosen again for vice-president. George J. Bauer was elected secretary. A. F. Crittenden, who has withdrawn from the motor car business, resigned from the treasurership and was succeeded by F. R. Luescher. The following were elected members of the board of directors: W. C. Barry, Jr., C. E. Hartson, A. M. Zimbrich, F. W. Peck, George J. Bauer, F. R. Luescher and Robert Thomson.

Thompson-Breese Plant Sold — The Thompson-Breese motor plow factory at Wapakoneta, O., which several weeks ago was thrown into the hands of a receiver, has been sold to John Breese, one of the former owners. Mr. Breese purchased the plant for $9,750. The plant will be enlarged and put into running condition at once.

New Goodyear Corporation—The Goodyear Tire and Rubber Co. of South America was incorporated at Augusta, Me., a few days ago with a capitalization of $3,000,000. The promoters named in the articles of incorporation are E. M. Leavitt, of Winthrop, Me.; Joseph Williamson, E. M. Hussey and M. D. Yeaton, of Augusta, and Pauline Lowell, of Hallowell.

Lamp Company Expanding—The John W. Brown Mfg. Co., located at Center avenue and West Broad street, Columbus, O., will award a contract for the erection of a large addition to its plant. The company is one of the largest manufacturers of motor car lamps in the country. The erection will be completed ready for occupancy by January.

Vehicle Club Election—The Electric Vehicle Club of Boston held its annual meeting recently, at which plans for reorganization were discussed. The organization committee was instructed to prepare a constitution and by-laws for presentation at the next meeting. The following officers were elected: Day Baker, president; E. S. Mansfield, vice-president; H. S. Thompson, secretary; J. S. Codman, treasurer; F. N. Phelps, Frank J. Stone and Morton J. Fitch, with the officers, executive committee.

Dividend Passed—The Federal Motor Truck Co. passed a stock dividend of $100,000 and declared a cash dividend of 10 per cent on November 14. This company was incorporated 3 years ago for $100,000 and has enjoyed a prosperous business since that time. Its output has increased from fifty trucks during the first year to 135 the second and 750 for 1912. For the coming season it is expected that about 1,500 will be sold. The officers of the company are T. E. Reeder, president; Edwin Denby, vice-president; Garvin Denby, treasurer, and M. L. Pulcher, general manager.

U. S. Tire Co.'s Sub-Branches—The United States Tire Co. has recently opened new sub-branches in Newark, N. J., Birmingham, Ala., Rochester, N. Y., Washington, D. C., and Milwaukee, Wis. In the near future sub-branches also will be opened in Providence, R. I., Worcester, Mass., Baltimore, Md., and Syracuse, N. Y., and in Columbus and Toledo, O. T. B. Goodloe, who has been in charge of the Richmond sub-branch, has been appointed manager of the Atlanta branch. Mr. Goodloe is succeeded in Richmond by J. G. Given. R. L. Ijams, who has been assistant to C. A. Gilbert, western district manager, has been transferred to the central district, under J. C. Weston, with headquarters in Chicago.

Moline Companies' Plans—Moline, Ill., manufacturers of cars—Moline, Velie and Midland—will be up and doing during the coming year. During the past season 3,182 cars have been built and marketed by the three factories. Plans for 1913 are for the building 5,900 cars, nearly twice the output of last year. During the coming year 3,500 Velie motor vehicles are to be put on the market, as against 2,200 for last season. But 200 Midland cars were made this year, but present plans call for the manufacture of 1,400 cars next year. The Moline Automobile Co. built 782 machines this year and will raise the mark to 1,000 during 1913.

New Plant in Syracuse—The large plant in North Geddes street formerly owned by the Syracuse Stove Co. has been sold to the Palmer-Moore Co., which will manufacture motor trucks. The concern has increased its capital stock from $100,000 to $200,000. T. G. Meachem is president, T. W. Meachem vice-president and Charles L. Palmer secretary and treasurer. For 3 years the company has been experimenting with a small plant on Talman street, turning out a two-cycle, slow-speed motor under patents granted to Edward Moore. A 1,500-pound delivery wagon will be manufactured. There will be soon 150 hands employed and 200 trucks will be put out the first 6 months of 1913.

Election at Albany—At the annual meeting of the Albany Automobile Dealers' Association, of Albany, N. Y., Chauncey D. Hakes was chosen president. Other officers elected were as follows: Vice-president, E. M. K. Hunt; secretary-treasurer, J. B. Wood; while these directors were chosen: Messrs. Hakes, Wood, Foskett, Hunt, Burlingame, Horace Rayno and A. M. Graham. Negotiations are pending for the show in the armory during the week of February 15-22. Unless satisfactory terms can be made the Albany dealers will arrange with the Troy, N. Y., dealers to have a joint exhibition in that city, as was done last year.

Bankruptcy Case in Washington—An involuntary petition in bankruptcy has been filed against the F. K. B. Co., motor car supplies, at 1110-1112 Fourteenth street N. W., Washington, D. C., by the Continental Rubber Co., R. E. Dietz Co. and the Commercial National Bank, of Washington, whose claims aggregate $12,000. The assets are said to be about $7,000. The bankruptcy court awarded adjudication, referred the case to a referee in bankruptcy and appointed Wilton J. Lambert and L. P. Loving receivers under a bond of $10,000. The company was formerly known as the Frank G. Fickling Co., and was reorganized last year when Fickling withdrew.

Development Briefs

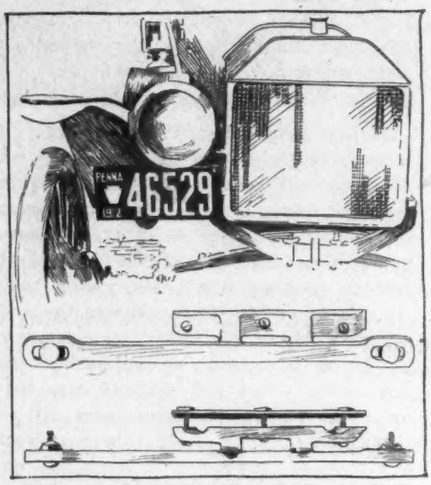


FIG. 1—KLINGENSMITH FORD FRONT LICENSE BRACKET

So-Sha-Belle Seating Arrangement

WHILE its name extols one of its virtues the So-Sha-Belle seating arrangement is an advantageous construction in many ways. This body construction, on which American and foreign patents have been secured, permits three passengers to occupy the front seats, without interference, and without substantially increasing the body width. This end is accomplished by setting the middle seat from 6 to 8 inches behind the front seat. This gives added seat width to the center seat, behind the other two. The driver occupies either one of the two side seats, where he is free from interference either from the hips or elbows of his seat-mates. While the body must be wider in front, it need not be as wide in the rear of a touring car as where three are seated abreast. The body length for seating six passengers is also greatly decreased, thus permitting the weight to be carried further forward, and the body to be built with less overhang at the rear.

Three general styles of bodies are used: Style A, in which the driver's seat is mounted on swivel levers, to be swung forward, under the wheel, permitting the other passengers to enter from the right side; Style B, in which the driver's seat is hinged to fold back against the back cushion, and in which the center seat is narrower than in the other two styles; and Style C, which has been adopted as the standard, in which the driver's seat slides back under the rear cushion, while the middle seat is extra wide. The side seats in this model, illustrated in Fig. 3, are provided with inside seat divisions, to provide the side passengers with more security. In the roadster models, an extra seat is fitted next the dash, which provides comfortable room for a fourth passenger. Touring car models have the same seating arrangement on the rear seat as on the rear. Two of these seating arrangements are shown in Fig. 6.

It is proposed by the So-Sha-Belle Seating Arrangement Co., of Los Angeles, Cal., holder of the Morgan patents covering this design, to grant license contracts to body builders and car manufacturers to use this design on a royalty basis.

Sager Bumpers

Leaders in the Sager line of bumpers for 1913 are the Sager Diamond bumper, which has been adopted by the Cadillac and Packard companies, and the Ford Special bumper. These two styles are two of forty, which constitute the Sager line, and are shown in Fig. 5. This line embraces tubular, channel, and reinforced channel types, and the statement of the Sager people that the diamond type is superior, is therefore to be taken as unprejudiced. This type of tubing consists of a heavy hardened brass tube, diamond shaped, reinforced throughout its length with a thick open-hearth steel rib. It is mounted on a special mounting in which all fastenings are concealed. The bracket is solid brass, inclosing a concealed spring, and plunger. It is secured to the frame by means of a set-screw and jam-nut inside the frame. The Ford Special uses a plain round bar, and a pressed steel bracket, which clamps inside the front channel section of the frame, by means of a U-shaped stirrup, while the shock-absorbing springs are concealed within the steel bracket. They are produced by the J. H. Sager Co., Rochester, N. Y.

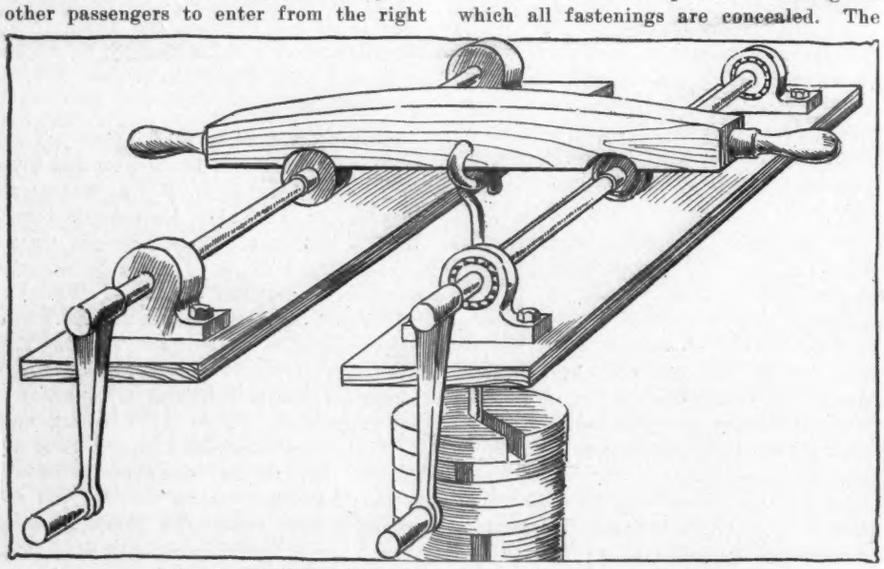


FIG. 2—HESS-BRIGHT BALL BEARING DEMONSTRATOR

One-Piece Formed Clutch Facings

Formed on a developed plane projection, accurately to fit the face of a cone clutch, a one-piece clutch-facing is offered by the Detroit Clutch Cover Co., Detroit, Mich., that possesses several points of interest. After investigating chrome or mineral tanned leathers, sole leathers, and various combination tans, the selection of a suitable tan, the most important point in the making of a clutch facing was decided in favor of solid oak tan, of which all of their facings are made. This leather is especially treated to resist heat and friction. The facings are made in the form of a true cone to fit exactly and individually the clutch for which they are made, and it is claimed, may be applied with the fewest number of rivets. The bearing is even about the entire surface of the clutch, which has a tendency to prevent grabbing and slippage under load. When manufactured in quantities for manufacturers, they are formed on special machines so that they are interchangeable and always of even thickness, permitting application by the most inexperienced. All that is required in application is to force the leather cone over the steel one, with the rivet-holes in line, and insert the rivets. The joint is

FIG. 3—SLIDING DRIVER'S SEAT OF NEW BODY

Novelties for Motoring

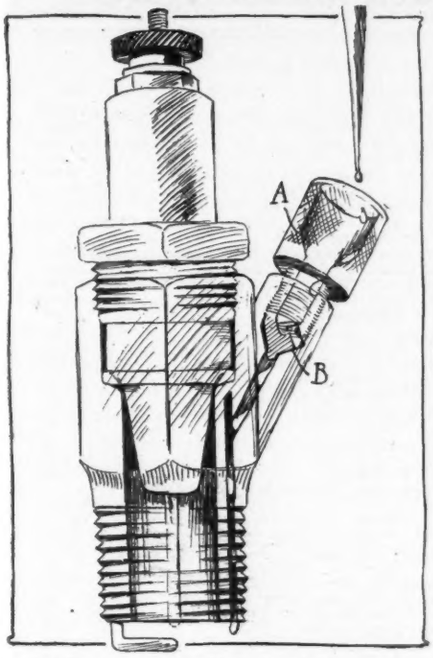


FIG. 4—CHAMPION PRIMING PLUG

usually invisible, as it is made with a 3-inch lap, secured by a water and oil-proof cement, the cone of leather being machined after forming and joining. A specialty is made of replacing old facings. For this purpose, the clutch cone with its facing is sent direct to the Detroit factory.

Champion Priming Plug

Latest among priming plugs is the Champion, manufactured by the Champion Spark Plug Co., Toledo, O., Fig. 4. This plug is standard, so far as its ignition features are concerned, but has on one side of its body a passage, and a priming cup, which is provided with a needle valve. In operation the small knurled brass priming cup A is filled with gasoline, then unscrewed from its seat so that the fuel can flow past the needle-valve B through the drilled passage in the plug shell to the bottom of the plug, near the sparking points. The brass cup is then screwed down again and the motor cranked. Owing to the close proximity to the sparking points, an explosion is said to occur in a perfectly cold motor with but a quarter turn of the crank, where, were the gasoline to be admitted through the manifold, it would not reach the plugs. As soon as the motor starts, the plug is heated, and the difference in expansion of the steel shell and the brass cup locks the latter securely. If in starting it is found to be impossible to turn the brass cup, it will be because the motor is warm and needs no priming. With the motor cold, so that priming is necessary, the brass will have shrunk more than the steel and will turn quite easily.

Convincing Sales Method

The Hess-Bright Mfg. Co., Philadelphia, Pa., has devised the novel demonstrating machine shown in Fig. 2. The purpose of this device is to demonstrate the superiority of anti-friction ball bearings over those of the plain type. It consists of a pair of shafts supported by a bearing at each end, having a weight on a cross-arm supported at their middles on third bearings. This weight is just about all the average man can lift, by raising one of the handles. The pressure on the bearings, therefore is severe. Turning the crank on the plain-bearing shaft, a surprising amount of resistance is felt which disappears when the shaft gets under way. This is entirely absent from the ball-bearing shaft, as far as can be detected, as it turns quite freely, in fact it will spin for several revolutions, and before stopping it will swing like a pendulum for several minutes. The other, however will not spin, but stops suddenly when released, and without regard to the position of the crank.

Saunders Gasoline Saver

To attempt to readjust the carbureter to meet changing road conditions is the height of impracticability, as carbureter adjustments are necessarily very delicate, and once set correctly should seldom be molested. To enable the driver to admit a greater quantity of air into his mixture at will, and without disturbing the carbureter adjustments in any way, the Saunders gasoline-saver is offered by the Leslie R. Saunders Co., Los Angeles, Cal. It consists of a small conical valve, situated in a threaded plug, which is inserted in the manifold, above the carbureter, and controlled by means of a Bowden wire from a lever on the steering column. It is claimed that, used as a brake, this device will not only save wear on the brakes, but will serve to clean the cylinders.

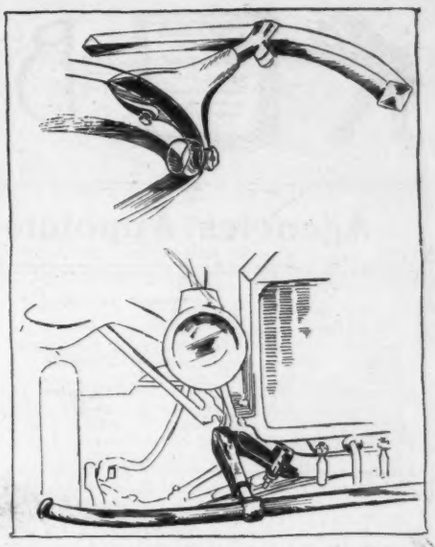


FIG. 5—SAGER DIAMOND AND FORD BUMPERS

Front License Bracket for Fords

Peculiarities of Ford construction make the application of a license bracket in front difficult unless it is suspended from the radiator cap, being disposed directly in front of the radiator. This position is to be avoided if possible, on account of the impairment of cooling that is the inevitable result, even though the perforated type of license-plate be used. The bracket shown in Fig. 1, permits the number to be carried in a prominent position, where it is secure and out of the way, and where it does not interfere in any way with proper radiation. The bracket consists of two parts, one adapted to be bolted to the number-plate, and provided with a notched back plate, the other being in the form of a clamp to clamp the lamp forks securely to the first. Three bolts are used on this clamp, which insures a tight grip, and will retain the bracket to the lamp fork, though any one of the bolts be lost. It is marketed by H. B. Klingensmith, Meadville, Pa., at a nominal cost.

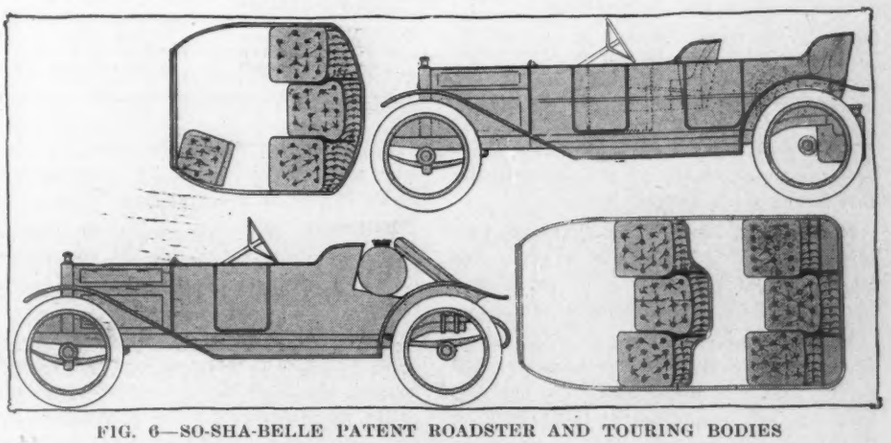


FIG. 6—SO-SHA-BELLE PATENT ROADSTER AND TOURING BODIES

Brief Business Announcements

Agencies Appointed by Motor Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Car
Allentown, Pa.	Luchenbach Brothers	Franklin
Akron, Colo.	George MacDonald	R. C. H.
Amarillo, Tex.	Lon Sellars	R. C. H.
Baltimore, Md.	Detroiter-Baltimore Co.	Abbott-Detroit
Baltimore, Md.	Henderson Motor Sales Co.	Henderson
Bartlesville, Okla.	Cherokee Motor Car Co.	Moon
Beloit, Wis.	L. Allen Co.	Abbott-Detroit
Berlin, N. H.	W. G. Dupont	R. C. H.
Bluefield, W. Va.	Appalachian Auto Co.	Apperson
Bluefield, W. Va.	Appalachian Auto Co.	Buick
Boston, Mass.	Hoyt Carburetor & Auto Co.	Havers
Buffalo, N. Y.	Automobile Sales Co.	Pullman
Columbus, O.	S. W. Schott & Co.	Empire
Columbus, O.	S. W. Schott & Co.	Brush
Columbus, O.	D. W. Short	Metz
Cincinnati, O.	Peters & Keating	Alco
Cleveland, O.	Maurice Rohrheimer	Alco
Craig, Ia.	Craig Auto Co.	Moon
Canton, O.	A. H. Wilson Motor Car Co.	R. C. H.
Cambridge, O.	J. B. Siegfried	R. C. H.
Davenport, Ia.	Richard Altendorf	Michigan
Darlington, Wis.	A. C. Poole	Abbott-Detroit
Dallas, Tex.	Davis & Turney Auto Co.	R. C. H.
Delhi, Minn.	Kunde A. Knudson	R. C. H.
Danube, Minn.	W. F. Schroeder	R. C. H.
Evanston, Ill.	Fancher Brothers	R. C. H.
Edgeley, N. D.	A. M. Hodge	R. C. H.
Gaylord, Minn.	N. C. Doering	R. C. H.
Garske, N. D.	R. J. Orchard	R. C. H.
Grand Rapids, Wis.	Jenkins Brothers Co.	Oakland
Govans, Md.	Otis E. Williamson	Norwalk
Grand Rapids, Mich.	Modern Garage	Alco
Grand Rapids, Mich.	Modern Garage	Marion
Greenville, O.	Swope Music & Auto Co.	Overland
Hammond, N. Y.	D. E. Coats	Franklin
Hudson, Wis.	Hudson Garage Co.	Overland
Hudson, Wis.	Hudson Garage Co.	Ford
Hackensack, N. J.	Beyer & Feakes	R. C. H.
Hicksville, N. Y.	Karlson's Garage	R. C. H.
Harrisburg, Ill.	Charles V. Parker	Moon
Hillsboro, Tex.	Walter-Hafner Jewelry Co.	R. C. H.
Ipava, Ill.	E. J. Weese	R. C. H.
Ipswich, Mass.	Ernest C. Currier	R. C. H.
Janesville, Wis.	Janesville Auto Co.	Herreshoff
Janesville, Wis.	Janesville Auto Co.	Chevrolet
Jacksonville, Fla.	Wiesenfeld Warehouse Co.	Alco
Jacksonville, Ill.	Modern Garage	Hupp-Yeats
Joplin, Mo.	Joplin Supply Co.	Moon
La Crosse, Wis.	Elsen & Phillips	Cole
Louisville, Ky.	Southern Motors Co.	Packard
Louisville, Ky.	Southern Motors Co.	Detroit
Little Rock, Ark.	C. L. Hoffman	Oakland
Leesville, S. C.	Model Garage	Oakland
Los Angeles, Cal.	L. C. Buxton	Moon
Long Meadow, Mass.	C. W. North	Havers
Loveland, Colo.	Ray Danner	R. C. H.
Little Rock, Ark.	Westcott Motor Car Co.	Hupp-Yeats
Little Falls, N. Y.	Frank F. Stacey	Franklin
Malden, Wash.	George E. Lattin	Abbott-Detroit
Mauston, Wis.	C. L. Sharp	Oakland
Miami, Fla.	Charles Jones	Alco
Madison, Wis.	Albrecht Motor Sales Co.	Cutting
Madison, Wis.	Albrecht Motor Sales Co.	Little
Madison, Wis.	Albrecht Motor Sales Co.	Herreshoff
Macon, Mo.	Macon Garage Co.	Moon
Mediapolis, Ia.	Fleenor's Garage	Moon
Montclair, N. J.	Montclair Garage & Machine Co.	Moon
Mancos, Colo.	George D. Woods	R. C. H.
Montreal, Que.	Royal Automobile Co.	Cole
Moira, N. Y.	W. S. Lawrence	R. C. H.
New Haven, Conn.	J. J. Lavercy	Moon
New Haven, Conn.	John J. Laverty	Moon
New Orleans, La.	Demack Motor Car Co.	Haynes
New York, N. Y.	Julius Lichtenstein	R. C. H.
Olean, N. Y.	G. R. Daniels	R. C. H.
Olsen, N. D.	Martin Rimestad	R. C. H.
Odell, Tex.	B. D. Smith	R. C. H.
Portage, Wis.	A. R. Slinger	Cole
Providence, R. I.	J. B. Higginson	Henderson
Portsmouth, O.	R. S. Pritchard	Mitchell
Portsmouth, O.	Portsmouth Automobile & Machine Co.	Paige-Detroit
Portsmouth, O.	W. J. Friel	Ford
Philadelphia, Pa.	V. P. Padula	Havers
Racine, Wis.	Gunther & Laux	Ford
Rochester, N. H.	W. H. Carll & Sons	R. C. H.
Rosenberg, Tex.	Rosenberg Motor Car Co.	Moon
Regina, Sask., Can	Regent Motors, Ltd.	Franklin
San Francisco, Cal.	L. S. Johnson	Arbenz
Syracuse, N. Y.	J. M. Watkins	Metz
St. Louis, Mo.	Wiemeyer Motor Car Co.	Ames
Syracuse, N. Y.	Jefferson Garage Co.	Alco
Sharon, Wis.	Anderson Auto Co.	Little
Savannah, Ga.	J. J. McDonough, Jr.	Oakland
St. Matthews, S. C.	Banks Auto Co.	Oakland
Schaller, Ia.	E. F. F. Hasseler	Moon
Seattle, Wash.	R. H. & H. C. Gray	Havers
Syracuse, N. Y.	James Auto Co.	Havers
Springfield, Mass.	Shean Auto Station	R. C. H.
Schenectady, N. Y.	W. D. Havens	R. C. H.
Sidney, Neb.	McIntosh & Brewer	Franklin
Tampa, Fla.	Charles H. Moorhouse	Alco
Taylor, Tex.	Prewitt Auto Co.	Moon
Terre Haute, Ind.	Terre Haute Machine Works	R. C. H.
Toledo, O.	Herman F. Hohly	Imperial
Wilmington, N. C.	H. L. Fennell	Oakland
Winfield, Ia.	Nesbitt Auto & Supply Co.	Moon
Wooster, O.	J. N. Ginter	R. C. H.
Waterville, Me.	Elm City Publishing Co.	R. C. H.
Wichita, Kans.	Kansas Motor Car Co.	Hupp-Yeats
Washington, D. C.	Dupont Motor Co.	Hupp-Yeats

TRUCKS

Allentown, Pa.	Allen Motor Co.	Lippard-Stewart
Baltimore, Md.	R. Stuart Beaver	Lippard-Stewart
Buffalo, N. Y.	Reinold Brothers	Lippard-Stewart
Cincinnati, O.	Peters & Keating	Alco
Cleveland, O.	Maurice Rohrheimer	Alco
Cleveland, O.	Henry E. Ricker & Co.	Lippard-Stewart
Edmonton, Alb., Can.	Northrup Motor Service Co.	Lippard-Stewart
Grand Rapids, Mich.	Modern Garage	Alco
Houston, Tex.	Young & Dwire	Lippard-Stewart
Jacksonville, Fla.	Wiesenfeld Warehouse Co.	Alco
Los Angeles, Cal.	Albert Biner	Lippard-Stewart
Miami, Fla.	Charles Jones	Alco
Nashville, Tenn.	Martin & Crocker	Lippard-Stewart
New York	Strong & Trowbridge	Sanford
Portland, Ore.	Coast Commercial Car Co.	Lippard-Stewart
Philadelphia, Pa.	Gomery-Schwartz Motor Car Co.	Lippard-Stewart
Rochester, N. Y.	Mandery Motor Car Co.	Sanford
Rochester, N. Y.	Mandery Motor Car Co.	Lippard-Stewart
Savannah, Ga.	Savannah Motor Car Co.	Lippard-Stewart
Salem, Mass.	North Shore Motors & Service Co.	Lippard-Stewart
Syracuse, N. Y.	Jefferson Garage Co.	Alco
St. Louis, Mo.	Federal Truck Co. of St. Louis	Lippard-Stewart
St. Paul, Minn.	Borg & Wharry Motor Co.	Lippard-Stewart
Tampa, Fla.	Charles H. Moorhouse	Alco
Utica, N. Y.	Crim-Bronner Auto Co.	Lippard-Stewart
Wilkes Barre, Pa.	Koons & Hallier	Lippard-Stewart

DETROIT, Mich.—J. C. Ayers has taken the managership of the General Motors Truck Co.'s Detroit branch.

Minneapolis, Minn.—The Minnesota Cartercar Co., 1021 Hennepin avenue, has leased part of the quarters of the Mercer Motor Sales Co., 729 Hennepin avenue.

Boston, Mass.—Manager H. D. Pruden, of the Boston branch of the Kisselkar, has moved from the Motor Mart into the new building just completed for the branch on Commonwealth avenue. It is a two-story building of reinforced concrete 74 feet wide and 200 feet deep. The salesroom is 74 by 70 feet on the first floor front.

Baltimore, Md.—The Baltimore branch of the Franklin Automobile Co. has moved into new quarters at 1919 North Charles street.

Minneapolis, Minn.—After considerable delay because of complications in the city council, the Ford Motor Co. has been able to let the contract for the excavation for its northwestern assembly plant and distributing warehouse at Fifth street and Fifth avenue N., covering a quarter city block. Work has begun.

Uniontown, Pa.—The Standard Garage Co. is building a $50,000 garage. The building will be two stories high on a lot 52 by 97 feet.

Springfield, Mass.—W. L. Bunker, secretary-treasurer of the Springfield Automobile Club, and A. V. Reopwell, formerly a member of the Woodward-Reopwell Motor Co. in that city, have formed a new

company to handle the Rambler, Chevrolet and Little cars in their territory with headquarters at 18-20 Fort street.

Bowmanville, Ont.—The Goodyear Tire and Rubber Co. of Canada has secured permission to increase its capital from $500,000 to $3,000,000.

St. Paul, Minn.—The Nolan Brothers Motor Truck Co., St. Paul agent for the Wilcox truck, is to open a garage January 1. The firm is looking for a location.

New Orleans, La.—Pending the complete overhauling of its salesroom and garage at Julia and St. Charles streets, the R. C. H. Sales Co. has occupied rooms at 811 St. Charles street.

Pittsburgh, Pa.—The foundations have been completed by Hennewitz Brothers, of Van Wert, O., for a two-story brick and concrete garage and machine shop, which will measure 60 by 132 feet.

Philadelphia, Pa.—C. H. Walz, until recently manager of the Auto Equipment Co., has been appointed general manager of J. H. McCullough & Son, dealers in supplies and accessories, 219-221 North Broad street.

Glens Falls, N. Y.—The Empire Automobile Co. has secured a 10-year lease of the entire Joubert & White building at 45-47 Warren street, and it will combine its garage business with the manufacture of motor trucks.

San Francisco, Cal.—Frederick J. Linz and L. W. Sanborn have purchased the entire assets and capital stock of the United Motor San Francisco Co. Both Linz and Sanborn have been identified with the Maxwell since 1905.

Boston, Mass.—The Motz Tire and Rubber Co. has changed its line in Boston, formerly handled by the Standard Tire and Rubber Co., as an agency proposition to a factory branch, with M. A. Frank as manager and headquarters at 4 Dundee street.

Webster, S. D.—A. W. Tyner has severed his connection other than a director of the Tyner Garage Co. and is succeeded by Katherine McGraun. A. W. Tyner, W. B. Bauer and Frank Forbes, of Aberdeen, have incorporated the South Dakota Motor Car Co., of Webster, with branches at Aberdeen, Huron and Deadwood. The officers are A. W. Tyner, president; Frank Forbes, vice-president, and W. R. Bauer, secretary-treasurer. The new company will handle the Detroiter for South Dakota.

Atlanta, Ga.—Undoubtedly one of the most elaborate garages ever run in connection with a hotel in the south is that just opened in Atlanta. It is called the Georgian Terrace garage and it adjoins the new resort and family hotel in Atlanta. The affair is really two separate buildings. The first is three stories in height and contains salesrooms, offices, an elaborately fitted chauffeurs' club room, shower baths and rooms for hotel employes. The garage proper is 125 by 150 feet and contains a machine shop as well as ample storage space. The new garage is run by A. L. Belleisle.

New York—E. V. Stratton has secured the services of Harry R. Fletcher. Mr. Fletcher will have charge of the sale of Flanders trucks.

New York—The A. Hazen Green Co., 1686 Broadway, New York, has been appointed New York distributor for the Zero 40, a non-freezing fluid for use in radiators.

Minneapolis, Minn.—The Northwestern Shawmut Tire Co. has moved to 1210 Hennepin avenue. The company has taken the agency also for Warner instruments. A. J. Hunziker is manager.

Detroit, Mich.—C. M. Clement has become production manager of the Metal Products Co. His former connection was with the Weston-Mott Co., Flint, Mich., of which he was factory manager.

Minneapolis, Minn.—The Robinson-Loomis Motor Truck Co. has changed its name to Robinson Motor Truck Co., due to retirement of Mr. Loomis. The company will continue to make Gopher and Minneapolis trucks.

Owego, N. Y.—Theodore D. Gere and Frank B. Tracy have formed a partnership to manufacture a commercial motor truck. Negotiations are in progress for leasing the Robert Nichols building in Owego for the manufacturing plant.

Minneapolis, Minn.—J. V. Campbell, formerly in charge of the Colby branch in Minneapolis, has gone to Chicago to take charge of the Colby branch there. A. Walch will open the new Minneapolis branch building about December 1.

Boston, Mass.—J. W. Hamilton, manager of the Roberts & Sherburne Co. in Boston, agent for the American line, resigned last week to go back to the banking business. J. C. Mullin, who has charge of the salesforce, is acting manager temporarily.

Chicago—The Electric Generator and Accumulator Co. has moved its local quarters from 2437 Michigan avenue to 1349 Marquette building. Its factory is at Argo and the concern makes electric lighting and starting equipment.

Minneapolis, Minn.—The Andersch Brothers Motor Car Co. has begun erection of the $50,000 building at Harmon and Spruce places, from which it will distribute Abbott-Detroit cars in the northwest. J. W. Murphy, Fargo, N. D., has been made district sales manager.

Detroit, Mich.—The Cleveland factory branch of the Lozier Motor Co. has been discontinued, a selling organization, to be known as the Lozier Sales Co., of Cleveland, having been formed for the purpose of selling Lozier cars in Cleveland and northern Ohio. It is understood that the new company has been organized with a capital of $50,000, subscribed by prominent business men of Akron, Ohio. A. W. Woodruff has been appointed manager of the new company. The salesroom will be located at 2336 Euclid avenue.

Minneapolis, Minn.—The H. J. Mich Auto Co., Franklin dealer, has moved into a new salesroom and service station at 1400 Hennepin avenue.

New York—The Gildel Auto Co. has been formed here to handle the Kline exclusively by Messrs. Gilman and Videl. Salesrooms have been opened at 1930 Broadway.

Philadelphia, Pa.—John Wilson Drown, formerly advertising manager of the Standard Roller Bearing Co., has been appointed sales manager of the Pressed Steel Mfg. Co., of this city.

Philadelphia, Pa.—Russell T. Kingsford has resigned his connection with the Peerless Motor Car Co. to accept the position of chief engineer with the Rushmore Dynamo Works, Plainfield, N. J.

Washington, D. C.—James J. Flynn has resigned as manager of the Washington branch of the Locomobile Co. of America. His successor has not yet been appointed. Mr. Flynn has several offers under consideration.

Richmond, Va.—W. D. Sapp has formed a company to handle the Overland and Gramm truck, with quarters at 303 Carey street. The company has not been named and will not begin operations until the latter part of November.

Chatham, N. Y.—Work will be started soon on the transformation of the Nellis building, Main street, Chatham, from a garage into a factory for the manufacture of motor car parts. Ralph Frear, who now runs the garage, will be retained as manager of the entire structure.

Denver, Colo.—The Michigan Motor Car Co., of Kalamazoo, Mich., has established in Denver a distributing branch for Colorado and Wyoming. The agency is in charge of F. P. Sevier, representing F. C. Cullen, of Chicago, the company's western agent. The same agency has also completed arrangements to represent in this territory the Waverley electric.

Milwaukee, Wis.—H. W. Bonnell has been appointed manager of the Milwaukee branch of the Mitchell Automobile Co., distributor for the Mitchell-Lewis Motor Co., of Racine, Wis., in Chicago, Milwaukee and other cities. Norman R. New continues as sales manager. L. A. Peil, president of the company, has disposed of his interest upon taking the position of sales manager of the Mitchell-Lewis Co.

Milwaukee, Wis.—One of the largest and most perfectly appointed public garages in the middle west is now being erected for Julius Strauss at Hackett and Downer avenues, Milwaukee. The building will have ground dimensions of 213 feet on Downer avenue and 65 feet on Hackett avenue, and will be two stories high. The first floor will accommodate seventy-five gasoline cars and the second will be ar-

ranged to care for 110 electric cars, with smoking room, shower baths, library and rest room for chauffeurs.

Detroit, Mich.—W. M. Jenkins, former sales manager of the Simplex Motor Car Co., has become Pacific coast representative of the Abbott Motor Co.

Rochester, N. Y.—The F. R. Luescher Co. has taken possession of the new building at 191 East avenue. The company handles the Rambler, Oldsmobile, Reo and Detroiter.

Detroit, Mich.—The Oakland Motor Car Co. has opened a new branch at Houston, Tex., with A. J. Challinoir in charge. Mr. Challinoir was formerly connected with the factory at Pontiac, Mich.

Tacoma, Wash.—J. B. Baldy, of Tacoma, will hereafter manage the Northwestern Equipment Co., at 505 South Ninth street, and will also act as Tacoma agent for Ajax tires. F. F. Athow is associated with the new firm.

Philadelphia, Pa.—The Perfection Tire Co., Inc., has leased the store and basement of the property at the southwest corner of Sixteenth and Sansom streets for a period of 5 years. The company will handle tires and accessories.

Akron, O.—The Firestone Tire and Rubber Co., of Akron, O., has closed a lease for the entire first floor of a new building at 197-199 East Gay street, Columbus, O., in which will soon be opened a large branch agency for that line of tires.

New Orleans, La.—A charter has been filed by the J. A. Landry Motor Car Co. asking the formal legal permission to do a general motor car business in this city. The company is capitalized at $25,000. It will deal in sundries and supplies.

San Francisco, Cal.—H. G. Salisbury, recently appointed general manager of the Pathfinder Motor Car Co. of California, has appointed Barry Cool manager of the San Francisco branch. Cool has been sales manager of the Hudson agency of Los Angeles.

Washington, D. C.—The Michigan Motor Co. has been incorporated under District of Columbia laws with the following officers: T. Oliver Probey, president; J. H. Stuart, vice-president; George R. Stuart, secretary-treasurer; F. C. Sibbald, sales manager; E. G. Powell, head of service department. The company has opened a salesroom and service department at 1230 Wisconsin avenue, and will handle the Michigan in this city and surrounding territory.

Beaver Dam, Wis.—Stoddart Brothers, liverymen at Beaver Dam for more than 30 years, on November 15 retired to engage in the motor car and garage business. The stables, considered the largest in the central part of Wisconsin, are being entirely remodeled, made fireproof and arranged for garage purposes. Stoddart Brothers intend to carry on only an agency business in connection with real estate and insurance, and the garage and repair shop will be conducted by the Beaver Garage Co., now situated on East Third street.

Louisville, Ky.—Extensive building extensions are under way in the electric vehicle department of the Kentucky Wagon Mfg. Co., maker of the Urban electric. After the alterations are made this department will have three times its present capacity.

Columbus, O.—The Seventeenth Street garage is the name of a garage and repair shop opened recently by R. V. Jones and David Tope at 95 North Seventeenth street.

Oconto Falls, Wis.—The Oconto Falls Motor Car Co., distributor of Overland and Ford cars, is building a $10,000 garage, to be fully equipped with machinery driven by electric power.

Portland, Ore.—W. S. Dulmage has purchased the interest of D. M. Smith, who has been associated with him in the firm of Dulmage & Smith. Mr. Dulmage has the agency for the Hupmobile.

Marshalltown, Ia.—The Marshalltown Motor Material Mfg. Co., Inc., or as known in the abstract as the M. M. M. M. Co., Inc., will henceforth abandon the names in question. It will be the V-Ray Co., Inc.

Melrose, Mass.—The new garage for the Smith Brothers Co., recently completed at Melrose, will take care of sixty-five cars, and the company has just taken the agency for the Overland cars and the Ajax tires.

San Francisco, Cal.—The Fiat agency in northern California, long controlled by the Pacific Coast Motor Car Co., has been taken over by Dwight Whiting, of Los Angeles. John Davis, from the Fiat factory, will be local sales manager.

Philadelphia, Pa.—J. V. Harrigan, lately assistant manager of the Firestone Tire and Rubber Co., has formed the M. S. H. Sales and Rubber Co., with headquarters at 660 North Broad street. Mr. Harrigan will act as vice-president of the new concern.

Baltimore, Md.—The Oakland Motor Co., representative of the Oakland car and Federal truck, has leased the large warehouse at Biddle, Howard and Park avenues. The company will continue to occupy the salesrooms at 6 and 8 East Chase street.

Philadelphia, Pa.—The Ford Motor Co. has removed from 250 North Broad street to 257-259 North Broad street. The past week also witnessed the opening of the company's new service and assembly building at Sixteenth street and Washington avenue.

Boston, Mass.—The Frank Rilion Co., well known in the electrical field in New England, with headquarters in Boston, has decided to build motor trucks of from 1 to 6 tons capacity, designed by Victor J. Houdon. The vehicles will be built in the present workshops in South Boston.

Boston, Mass.—The John S. Harrington Co., which began business first in Worcester, then branched out to Providence and later entered Boston, and handles the Flanders line, has decided to make the Boston office its main distributing headquarters hereafter instead of its salesrooms at 730 Main street, Worcester.

Recent Incorporations

Auburn, Ind.—DeSoto Motor Car Co.; capital stock, $20,000; directors, L. M. Field, H. Fry, G. Fry, V. Van Sickle, H. J. Clark.

Buffalo, N. Y.—American Kushion Kore Tire Co.; capital stock, $10,000; incorporators, Charles H. Taylor, C. M. Baldy, K. E. Wilhelm.

Chicago—Grove Auto Truck Garage Co.; capital stock, $50,000; general motor car and garage business; incorporators, T. E. McBeill, H. McCurdy, W. H. Neterer.

Chicago—Keeton Motor Co.; capital stock, $60,000; to manufacture motor cars and accessories; incorporators, K. R. Roberts, W. C. Spenny.

Cleveland, O.—Hall Miller Auto Co.; capital stock, $5,000; to deal in motor cars; incorporators, J. A. Freund, Jr., L. D. Greenfield, J. A. Freund and others.

Cleveland, O.—Northern Ohio Motor Co.; capital stock, $25,000; to deal in motor cars; incorporators, H. W. Bell, E. L. Denning and others.

Cleveland, O.—Motor Mechanism Co.; capital stock, $25,000; to manufacture and deal in motor cars and parts; incorporators, E. Younger, F. Castle, H. O. Evans, H. E. Gray, S. E. Sackerman.

Cleveland, O.—Hall-Miller Automobile Co.; capital stock, $5,000; to deal in motor cars; incorporators, H. W. Bell, E. L. Bennings, F. C. Anselm, E. P. Eirich, C. L. Guthrie.

Cleveland, O.—Auto Mart Co.; capital stock, $10,000; to deal in and hire motor cars; incorporators, E. C. Plietz, W. L. Radcliffe, W. H. Hasselman, W. R. Wallace, L. C. Heimberger.

Danbury, Conn.—Fillow Auto Co.; capital stock, $30,000; to manufacture motor cars; incorporators, A. H. Fillow, J. W. Juengst, B. M. Fillow.

Dunkirk, N. Y.—Niagara Motors and Manufacturing Co.; capital stock, $275,000; incorporators, E. J. West, M. M. Hedden, D. W. Fry.

Greensboro, S. C.—Reitzel Auto Service Co.; capital stock, $25,000; incorporators, O. C. Klingman, J. H. Reitzel, L. G. Klingman.

Indianapolis, Ind.—Hunter-Hammond Auto Co.; capital stock, $12,000; to manufacture motor cars and accessories.

Kansas City, Mo.—Four Points Garage, Livery and Repair Co.; capital stock, $2,000; incorporators, J. L. Brown, B. F. Brown, D. I. White.

New York—Twelfth Street Garage Co.; capital stock, $60,000; incorporators, D. G. McOtter, W. H. Devlin, Sr., George M. Hamilton.

New York—Miller-Brisben Co.; capital stock, $25,000; to deal in motor cars; incorporators, W. A. Miller, I. Jaffee, J. McN. Brisben.

New York—Gasoline Safety Appliance Co.; capital stock, $150,000; to manufacture and deal in gasoline.

New York—Foreign and Domestic Automobile Repair Co.; capital stock, $10,000; incorporators, L. O. Rothschild, Max Kaplan, Otto A. Deffaa.

Pittsfield, Mass.—J and B Mfg. Co.; capital stock, $25,000; directors, F. A. Knight, E. B. Jacobson, J. J. Whittlesey.

Racine, Wis.—Racine Auto Tire Co.; capital stock, $75,000; to manufacture pneumatic tires; incorporators, L. J. Elliott, C. Wright, M. E. Walker.

Richmond, Ky.—Madison Garage; capital stock, $2,000; incorporators, R. Montgomery, F. E. Chase, M. C. Kellogg.

San Antonio, Tex.—Knight Motor Car Co.; capital stock, $10,000; to deal in motor cars and accessories; incorporators, H. L. Knight, A. H. Danforth, A. H. Elmore.

Shelbyville, Ky.—Fawkes, Pulliam & Graham; capital stock, $3,300; to conduct a garage; incorporators, E. B. Graham, G. Fawkes, H. Pulliam.

Stoughton, Mass.—Panther Rubber Mfg. Co.; capital stock, $150,000; directors, F. Berenstein, W. Bernstein, M. Marcus.

Wilmington, Del.—Macandaruba Tire Filler Co.; capital stock, $1,500,000; incorporators, H. R. Ewart, C. J. Jacobs, H. W. Davis.

Wilmington, Del.—Rota Engine Co.; capital stock, $100,000; to manufacture engines and motors.